

THE POLAR TIMES



AMERICAN POLAR SOCIETY

Secretary's Letter

It has been a rewarding six months since we published our "first" issue of *The Polar Times*. Most rewarding is the response from old members of the American Polar Society who wrote personal notes of encouragement. At first, we planned to thank each of you individually; however, there have been too many and we are swamped. Many thanks to all of you old polar explorers.

Some of you clipped and mailed articles for possible inclusion in *The Polar Times*. Several are published in this issue. We are grateful for these articles and encourage all members to not only clip from publications, but to put pen to paper and submit personal stories as well as scholarly articles. *The Polar Times* is your magazine and we want to hear from you.

When August Howard died, the membership of the APS stood at 1,500. We sent *The Polar Times* to those listed on this roster and later sent a first-class flyer. To date, we have about 600 returns from this list. Many past members have moved since the old list was

generated in 1985, and we have no way of tracing them. Some, unfortunately, have died.

On the bright side, though, we have picked up about 200 new members from various sources. We do, however, need a larger membership base if we are to secure a financially sound future. Per-issue costs go down dramatically if we can push membership over 1,000!

So pass along photocopies of our application to other old polar explorers and anyone who has an interest in the polar regions.

Again, thank you for your warm response and enthusiasm. It has been a pleasure to open the mail for the last six months. Come visit in Oregon. I keep an open door for old explorers from "the ice," both north and south. Feel welcome to spend a night or two and swap tales of heroism and daring in the polar regions.

Sincerely,

Brian Shoemaker

The Polar Times

Published Semi-Annually at the
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by the
AMERICAN POLAR SOCIETY

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P.O. Box 692 • Reedsport, OR 97467

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The American Polar Society was founded Nov. 29, 1934, to band together all persons interested in polar exploration. Membership dues are \$10 a year (\$12, foreign), and entitle members to receive *The Polar Times* twice a year.

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Editor's Note

Thank you *all* for your wonderful letters of support!

This issue, we're introducing "The Young Explorers" with information and activities for our young friends. And we thought you would enjoy our cover, which is a reproduction of the very first *Polar Times*, published in June 1935.

Sincerely,

Della Weston

American Polar Society

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Membership in the American Polar Society is open to all who are interested in the Polar regions. Dues are \$10 per year (\$12 foreign, \$100 corporate) and entitles the member to an annual subscription to *The Polar Times*.

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CONTENT

- 3 Alfred Johnston and the Bear
- 3 Byrd Polar Research Center
- 4 World's Deepest Ice Core
- 5 The Spat Over the North Pole
- 6 Middle School Teacher
- 7 Ultralight Mother
- 7 Antarctic Expedition
- 8 Russians Open Arctic for Business
- 9 Member Antarctic Expedition
- 10 Reclaiming U.S. Antarctic History
- 11 Dog Sleds
- 12 Return to the Arctic
- 13 Antarctic Hooved Animals
- 14 Two-Pole Dream Comes True
- 15 Trans-Antarctic Medical Mission
- 15 Photographer to the Bears
- 15 Volcano Under South Pole
- 16 Vaughan Expedition
- 17 Scientists Unearth Bedrock
- 17 Polar Bear Bones
- 18 Jensen Arctic Museum
- 18 Tragic Helicopter Accident
- 19 Whalers March
- 19 Minke Whale Hunt
- 19 No Incinerator by NSF
- 19 Remembering "Short" Seeley
- 20 Ozone Over Antarctica
- 20 Young Explorers
- 22 Obituaries
- 22 Letters
- 23 Hero News

The Polar Times

American Polar Society • Fall-Winter 1993

Alfred Johnston and the Bear

Philadelphia Enquirer, March 18, 1993

History has always been a part of Alfred Johnston's projects, but he probably will never have a closer brush with it than during the episode of the icebreaker *Bear*, one of the most celebrated vessels to fly the colors of the United States.

While in Nova Scotia in the early 1960s, Johnston came across an old three-masted barkentine, a forlorn and pretty much forgotten ship docked there. He began digging into its history. The *Bear* had been built in 1874 in Dundee, Scotland, for a seal-hunting firm. In 1883, the ship was purchased by the United States because such a sturdy, ice-breaking vessel was needed to go to the Arctic to rescue the remnants of the expedition led by Adolphus Greely.

After that, the vessel became a U.S. Department of Revenue cutter, running between Oakland, Calif., and Alaska, Siberia, Point Barrow and other frosty ports. At some point, it was retired and became a

floating museum, docked in Oakland, Calif.

Then, Adm. Byrd needed a stout ship for his Antarctic expedition in 1927, and the *Bear* went back to work. By 1941, the *Bear*—now demasted and equipped with engines—was patrolling the north Atlantic for the Coast Guard. Within hours of the start of World War II, the *Bear* encountered a German freighter on its way home. The freighter became the first enemy ship captured by Americans in that war.

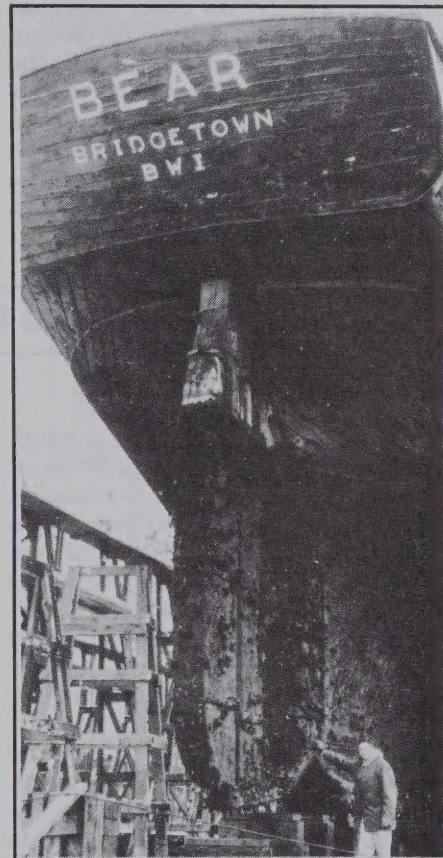
Learning all this history, Johnston was thrilled. He bought the ship for \$12,000, put back the three masts, recreated the bowsprit, outfitted the ship as a restaurant, and got permission to dock it at Penn's Landing in Philadelphia.

On March 19, 1963, the *Bear* was being towed to Philadelphia when a storm blew up. The towing cable parted, and the *Bear*, after almost a century of service, went down.

"I think about her a lot," Johnston said a bit wistfully. "I'm thinking I might even create a full-scale replica of her."

And given Johnston's track record, the good ship *Bear* may yet sail again.

ED. NOTE: See *The Bear* on the back cover.



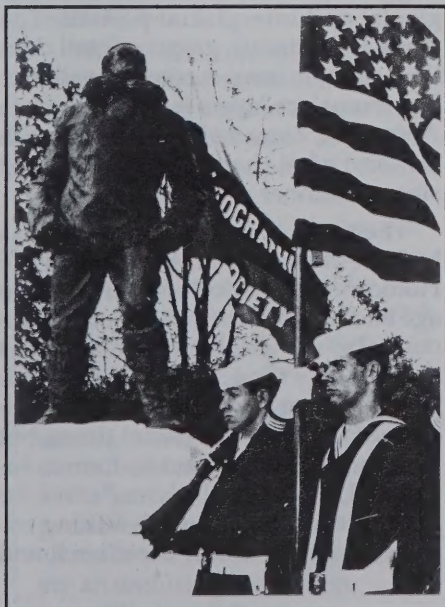
Alfred Johnston with the *Bear* in dry dock, where she was being refitted

Byrd Polar Research Institute—A Focus on America's Polar Heritage

Few Americans realize that their fellow countrymen have played a major role in the exploration and scientific discovery in both of the world's polar regions—north and south. Much of the Arctic, including a claim to the North Pole, can be attributed to Americans, and discovery of Antarctica (arguably) and exploration of the interior of the continent were accomplished mostly by Americans. Accompanying this geographical discovery, the United States has also led the world in scientific exploration of both the Arctic and Antarctic.

Unlike many other nations that have been active in polar research and exploration, the United States has lagged in the development of a polar center dedicated to furthering field research and preserving the nation's polar heritage. The Byrd Polar Research Institute (BPRI) at Ohio State University in Columbus, Ohio, has made great strides to change this shortcoming and has developed into one of the world's major centers of polar and alpine research as well as becoming a

(Continued on page 4)



prominent center for the study of polar history.

Located on the west campus of the university, BPRI occupies a 20,000 square-foot modern structure, Scott Hall. The facility houses four cold laboratories, four lecture halls, a polar library, an archive for polar papers as well as an administrative center for coordinating research. Research at the center focuses on the role of cold regions in the global climate system, with major themes focused on climatic reconstruction of glacial and post-glacial times; polar ice sheets: dynamics,

history and ice-atmosphere interactions; high-latitude landform evolution, soils, and hydrology; geologic evolution of Antarctica; and the history of polar exploration. The BPRI staff includes over 60 full-time researchers.

Of main interest to the general public is the BPRI Archival program which has the papers of explorers and scientists who have contributed to knowledge of the polar regions. Particularly noteworthy are the letters, photographs, and artifacts of Rear Admiral Richard E. Byrd and Sir Hubert Wil-

kins. As pioneers in polar aviation and navigation, these men were instrumental in the exploration of most of Antarctica. The Goldthwait Polar Library has more than 14,000 titles and office space for visiting scholars and researchers.

Dr. Ken Jezek, director of BPRI, notes with pleasure that the center is now one of the leading centers for polar research in the world; however, he is quick to caveat that this is only a beginning—there are bigger things to come.

—Brian Shoemaker

World's Deepest Ice Core Yields Climate Archive

by Lynn Simarski, NSF

After five years of drilling through the Greenland ice sheet, National Science Foundation (NSF)-sponsored researchers have extracted the world's deepest ice core—reaching 3,052 meters (10,013 feet) on June 29—and are about to hit rock bottom. The 5.2" diameter core through the summit of the ice sheet, along with a European core completed last year 30 kilometers (18.6 miles) away, is furnishing the longest, most detailed record available of the Northern Hemisphere's climate, reaching back about 250,000 years. Together, the cores are altering ideas about the very nature of the earth's climate system.

The cores reveal a climate history whose dynamism has startled researchers. The biggest surprise so far is that climate changes much more rapidly and frequently than we ever believed before" said Paul Mayewski, chief scientist for the Greenland Ice Sheet Project (GISP 2), which includes scientists from more than 20 U.S. universities and laboratories, and is part of NSF's Arctic Systems Science initiative. Patterns of past climate stored in the ice show that climate changed substantially every few thousand years, until the end of the last ice age.

One climatic interlude recorded in the ice, the so-called Younger Dryas, has drawn great scientific attention because of its abrupt onset and conclusion, as described by Richard B. Alley of Pennsylvania State University and co-authors in the April 8, 1993, issue of the journal *Nature*. The last ice age

ended about 15,000 years ago and warmer temperatures reigned; about 2,000 years later, climate chilled again—dropping 7° C in Greenland—during the Younger Dryas. Then, the earth switched very rapidly, in perhaps as little as three years, to the relatively balmy conditions that have persisted until today.

What is more, climatic conditions over central Greenland also fluctuated back and forth within just a few decades—well, within a human lifespan—before finally settling into a new state. These findings were described by Ken C. Taylor of the Desert Research Institute and coauthors in the February 4, 1993, issue of *Nature*. The swings in temperature and atmospheric chemistry recorded in the ice may reflect massive shifts in the circulation of the atmosphere and oceans, researchers suggest.

The GISP core was drilled over five summers, during which about 50 scientists, drillers, and camp staff have lived atop the flat, white expanse of the ice sheet, extracting and processing lengths of core. All staff and supplies are flown in on ski-equipped LC-130 planes of the 109th Air National Guard of Scotia, N.Y. The Polar Ice Coring Office of the University of Alaska-Fairbanks developed the drill and outfitted the camp, while the GISP 2 Science Management Office of the University of New Hampshire developed the core processing facility and coordinates the project.

The American and European ice cores harbor the best records of climate

obtainable—more continuous and with finer detail than the information stored in tree rings, coral growth layers, or the annual sediments of lakes. The ice archive was created as snow fell over Greenland year after year, trapping the gases, chemicals and dust of the atmosphere, which are valuable clues to volcanic activity, biological productivity, desertification, and atmospheric circulation at the time the snow fell. The layers of snow eventually compressed together into the massive ice cap.

The Greenland cores comprise a unique record for the Northern Hemisphere, particularly in light of evidence that the circulation of the north Atlantic Ocean seems to play a key role in climate dynamics—possibly even triggering the switchovers between glacial and interglacial periods. The cores also contain greater detail than the Antarctic cores currently available: The annual ice layers in the cores from Antarctica, extracted at locations with less snowfall than at the Greenland site, are thinner and harder to read.

The cores reveal that climate has been remarkably stable during the Holocene, the period since the last ice age ended. "But the richly detailed record also shows climate fluctuations during this time," Mayewski said. "These were relatively minor compared to changes in glacial times, but had a significant impact on human society." The Medieval Warm Period, for example, coincided with Viking expansion into Iceland, Greenland, and

CONTINUED ➡

Newfoundland, while the Little ice Age, from about 1400-1900 A.D., contributed to the abandonment of colonies in the north Atlantic and northern Europe.

The cores may also shed light upon the consequences of the global warming apparently being fostered by human activity. "It's clear that our climate system has been capable of rapid change in the past," said Michael Morrison, associate director of the GISP 2 Science Management Office, "while human impact on the atmosphere is also obvious in the ice core.

"Industrial activity has actually changed the same constituents in the atmosphere—such as carbon dioxide, sulfate, nitrate, and methane—that have varied with natural climate changes in the past," Morrison said.

The climate history housed in such fine detail by the Greenland cores may ultimately permit researchers to unravel the mechanisms of climate change—and help to assess whether human activity might once again set off such changes.

Dues

In order to simplify collection, we are decreeing membership fees to be due on the first of the year. Those of you who paid \$10 sometime during 1993 should have received both the spring and fall issues of *The Polar Times*. Your membership fees will be due on January 1.

Those who cannot remember how much they submitted can tell by examining the last line on their address label. If it says "10/1293," it means that you paid \$10, and your dues are current until midnight Dec. 31, 1993. With the coming new year, you will be defunct if you have not submitted by that time. Last lines that read "20/1294" and higher have another year's grace, and so on.

Your support and encouragement are critical. Our volunteers contribute infinitely more than \$10 a year in time and out-of-pocket expenses. Together we will all make the American Polar Society an enduring institution.

They're Still Spatting Over the North Pole

by Michael R. Lafferty

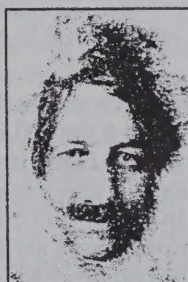
The Columbus Dispatch, Oct. 22, 1993

Adm. Robert E. Peary, looking from the grave, no doubt is upset that polar researchers are still not sure whether he or his nemesis and fellow American, Frederick A. Cook, reached the North Pole first.

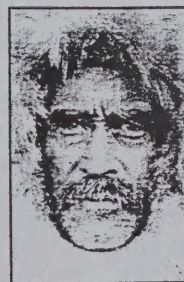
Polar scientists from across the world are meeting at Ohio State University today [Oct. 22, 1993] and Saturday [Oct. 23, 1993] to renew debate on the 85-year-old issue of who made it to the absolute top of the world.

Most history books accept Peary's claim that he gained the pole in 1909, but some historians still believe Cook, who said he arrived almost a year earlier, in 1908.

There are strongly held views on both sides, and scholars from France, Canada, England, Denmark, and Russia will be among the 100 polar experts expected at the public meetings beginning at 9 a.m. in Scott Hall, 1090 Carmack Rd.



Cook



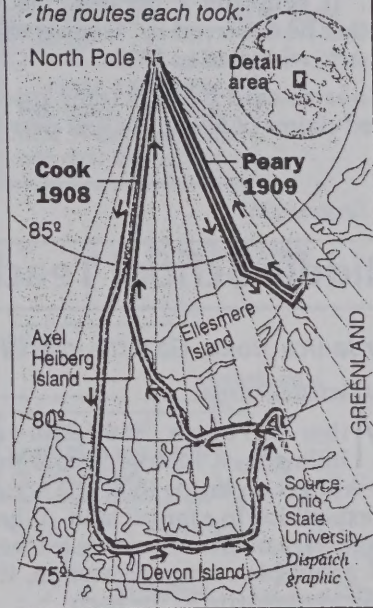
Peary

"I kind of worried that I should have padded the auditorium," said Kenneth Jezek, director of the Byrd Polar Center, which is hosting the debate. The OSU conference is an outgrowth of a meeting two years ago at the U.S. Naval Academy where Peary's side was pushed. The Frederick A. Cook Society wanted an opportunity to set the record straight, as it sees it, and is sponsoring this meeting.

At the turn of the century, there was still a fair amount of blank space on maps, especially near the top and bottom of the world. Exploration caught the public's attention, and Peary and Cook were two of the last romantic ex-

Poles apart

Frederick A. Cook said he reached the North Pole April 21, 1908, but Adm. Robert E. Peary's claim that he reached the pole on April 6, 1909, was given more credence. Here are the routes each took:



plorers, a breed that died quickly after World War I.

Today, Cook, who died in 1940, is a little-known figure outside the polar research fraternity. He was the first American explorer to participate in expeditions to both polar regions, and he was knighted by the King of Belgium for helping to save a Belgian expedition to Antarctica.

He was a physician on Peary's trip to northern Greenland in 1891-92. The two men had a falling out when Peary would not allow Cook to write an article about his adventures, according to OSU archivist Raimund Goerier.

Each mounted separate polar expeditions in the early years of the 20th century. Although Peary's expedition was larger and better equipped, both men used small parties and dog sleds on their polar quests.

In September 1909, during a voyage from Greenland to Denmark, Cook stopped in the Shetland Islands and cabled authorities that he had reached the North Pole on April 21, 1908. Five days later, Peary, having docked his

(Continued on page 6)

ship in Labrador, reported, "I have the Pole, April 6, 1909."

Both men had problems with their accounts, Goerier said. In time, and prodded by Peary's publicity machine, which included the National Geographic Society, the Navy man's claim was given credit, and Cook was forgotten. "It remains a mystery as to whether he deserved it," Goerier said of Peary, who died in 1920.

Goerier said Cook's later-quested claims of being the first person

to climb Mount McKinley in 1906 hurt him, as did a 1925 conviction for fraud in connection with selling Texas oil wells.

But time hasn't been kind to Peary, either, who has been painted by some authors as a paranoid obsessed with fame.

"Peary was a megalomaniac when it came to the pole. He wanted to do this his whole life," Goerier said. "You can imagine Peary's consternation when Cook claimed it."

And then there's a third group of authorities who believe that neither Peary nor Cook knew where he was. Cook's navigational instruments were lost so their calibration could not be verified. Peary apparently failed to take into account that the North Pole is in the middle of the Arctic ocean and that the polar ice cap is constantly on the move. He may have never been where he thought he was.

Middle School Teacher's Cool Summer

by Janice Hoke, *Gazette-Journal*

Reno Gazette-Journal

Mike Savage's students at Billinghurst Middle School this year will get an inside look at a scientific expedition to a far-off land. When Savage, 41, a math and science teacher, talks about his summer vacation, it's not an average trip to the beach.

In fact, he practically froze. Savage spent five weeks in Greenland in June and July assisting in a research program that revealed some chilling findings about the Earth's climate.

It was not a relaxing vacation for Savage. His job at Greenland Ice Sheet Project 2 was helping scientist Dr. Ken Taylor with heavy six-meter-long cores of ice drilled from the ice cap. Funded by the national Science Foundation, scientists from 17 universities and support personnel have been drilling since 1987. "This summer," said Savage, "we hit bedrock. There was quite a good party that night."

The project produced cores dating back to 250,000 years ago, from a depth of more than 9,000 feet. In a trench 30 feet below the surface, after slicing the cores lengthwise, Savage and Taylor passed 10,000 volts of electricity through each section to measure conductivity, which reveals snow layers, trapped bubbles of air, and other indications of climate, solar, and volcanic activity.

Living in polar conditions where the temperature ranges between freezing and 30 degrees below zero Fahrenheit, he worked six and a half days a

week, from 8 a.m. to 7 p.m. He could only work two hours at a stretch because of the cold, despite wearing heavy winter clothing.

Water for drinking and for showers every four days came from melted snow. Although the altitude was 10,500 feet above sea level, being at the top of the Earth made the effective altitude about 13,000 feet. The camp consisted of tents pitched on the ice, and transportation was cross-country skis or snowmobiles. Supplies came in on a ski-equipped Hercules C-130 cargo planes from the New York Air National Guard.

He said that the research shows that the climate for the past 8,000-10,000 years, since humans have come upon the world scene, has had abnormally few mood swings. In earlier centuries, average global temperatures swung wildly. This could be bad news for agricultural patterns, floods and rising sea levels," said Savage.

Savage, a meteorologist, is no stranger to cold. He first lived at the South Pole in 1980 as a weather observer, where he met his wife, Martha, a seismologist, now at the University of Nevada, Reno. He returned every year for five years after that to set up automatic weather stations.

Savage was able to join the expedition through a cooperative program between Reno's Desert Research Institute and Nevada school districts, including Washoe County School District.

Savage will draw up 10 lesson plans for middle-school earth science classes

using his Greenland experiences. Those lessons and the ones compiled by the other five teachers go into a book compiled by DRI, sent to all state high schools and middle schools.

Teachers can use his plans, said Savage, to teach about climate changes and scientific methods using ongoing, fresh, provocative research.

Instead of seeing science as boring and static, the lessons should give students a feeling of "Gee whiz, you were there," he hopes.

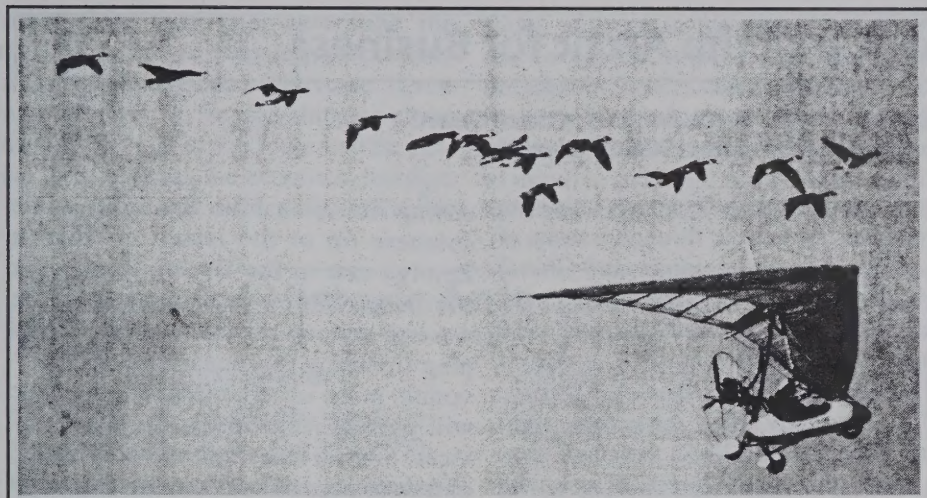
ED. NOTE: See article on "Deepest Ice Core," page 4, and "Bedrock," page 17.

A Big Thank You

Polar Associates, Inc., of Santa Barbara, Calif., Serebakian, Inc. of Monroe, N.Y., and Antarctic Support Associates of Englewood, Colorado, have become the first corporate sponsors of the American Polar Society.

Polar Associates has a long history of research support in the north polar region and Antarctic Support Associates has been active in support of American programs in Antarctica.

The American Polar Society actively seeks corporate sponsors to play a major role in supporting the American Polar Society.



Learning at the Ultralight Wingtips of 'Mother'

by D'Vera Cohn

Warrenton, Va.—The grassy landing strip is ready and if all goes as planned, a flock of geese will fly here later this summer, led 350 miles from Canada by an ultralight aircraft they believe is their mother.

The experiment is designed to test the potential of what scientists call "imprinting": when birds hatch, they attach themselves to the first thing they see and follow it around.

Birds have imprinted on people, cars and even a boat, but Canadian artist and pilot William Lishman found a new twist five years ago when he and his plane trained a gaggle of geese to fly near his Ontario home. This summer, he and a second pilot hope to test whether the birds will follow their two aircraft on a long migratory route that includes an overnight stop or two.

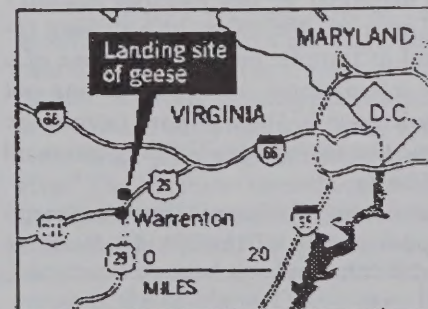
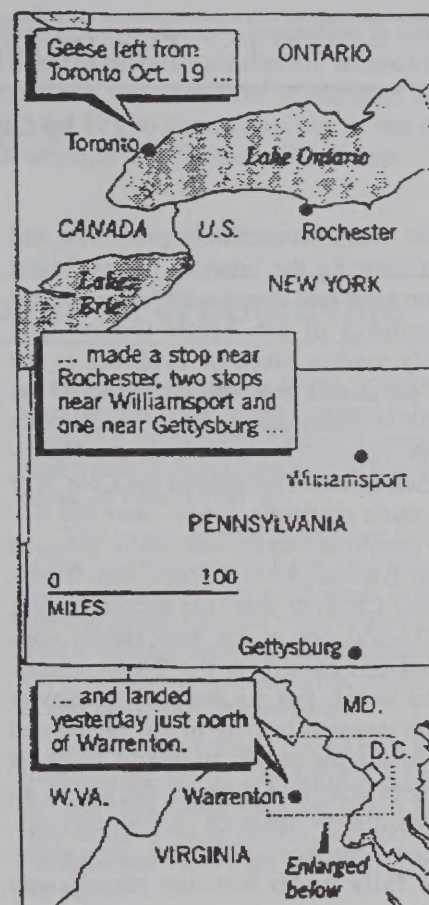
The birds are to land at Airlie, a sprawling conference center 50 miles from the district amid Fauquier County horse country.

They are to winter under the care of Lishman's scientific partner, William Sladen, a Johns Hopkins University ecology professor emeritus who supervises Airlie's environmental program and its collection of rare swans.

Next spring, the plan is to have Lishman lead half the radio-collared flock back to his property near Toronto. If the experiment succeeds, the birds will fly down from Canada on their own in the fall of 1994. (The other half of the flock will be left alone to see whether they find the return route on their own.)

"It is the most exciting thing I've ever done," said Sladen, an international authority on penguins and waterfowl who twice received British royal honors for his work in Antarctica. "It has all sorts of wonderful potentials."

If the experiment works on common geese, it could help restore populations of rare birds such as whooping cranes.



Back Issues of The Polar Times

We have had several requests for back issues of *The Polar Times*, all the way back to 1934. We plan to accommodate these requests in the future; however, until we get our feet on the ground, we will have to delay this service. Please understand that back issues are archival material, and we must set up a system that ensures their safety and security. Give us a year—we're working on it!

Antarctic Expedition

A French expedition will attempt the first descent into the crater of Antarctica's Mount Erebus, site of a rare lava lake, the education ministry in Paris said. It said the scientists would collect lava samples from the crater to define the volume and nature of gases released into the atmosphere by the 12,540-foot volcano. They will also examine the sea around the Antarctic for radioactive fallout from nuclear tests in the Northern Hemisphere. The expedition, led by Antarctic and oceans specialist Jean-Louis Etienne, is expected to leave next month from Hobart, in Tasmania, and reach the crater in mid-January.

The Russians Open the Arctic for Business

by Captain Lawson W. Brigham, U.S. Coast Guard
Commanding Officer, USCGC *Polar Star*

The years immediately preceding and following the breakup of the Soviet Union have had a profound impact on the geopolitics of the Arctic Ocean. One highly visible piece of evidence is the new status and potential international use of the shipping lanes along the Russian North, collectively known as the Northern Sea Route. Throughout the Cold War this same maritime zone—once the Soviet maritime Arctic, including sections of the Barents, Kara, Laptev, East Siberian and Chukchi seas (see accompanying map)—was one of the most tightly controlled and closed (to the West) regions in the world. For six decades the Soviet Union invested heavily in this region and gained marine access to nearly all of its northern coastline through the use of an extraordinary fleet of technically advanced icebreakers and polar cargo ships. Now fully under Russian jurisdiction and managed by the Russian Ministry of Transport, the route, in a striking reversal of fortune, holds the promise of a new international waterway linking not only Europe to the Far East (across the Arctic Ocean) but also both regions to all of Siberia.

Soviet and Russian icebreaking cargo ships—mostly of the SA-15 *Noril'sk*

class—chartered to Western shipping companies have made through transits of the route (Europe to Japan and China) during the ice navigation or summer seasons of 1989 through 1992. During 1990 to 1992, Murmansk Shipping Company's nuclear-powered icebreakers, the *Rossiya* and the *Sovetskiy Soyuz* made three summer voyages to the North Pole and transits along the Northern Sea Route with paying Western tourists on board; another expedition to the North Pole with Western adventurers is scheduled for late July 1993 on board the newly commissioned Russian nuclear-powered icebreaker *Yamal*. During August 1991 the French polar vessel *L'Astrolabe* made a through passage of the route escorted in several locations by Russian polar icebreakers. This was the first such foreign through transit since 1940.

Near the end of the Soviet Union on 14 September 1990, the country's former Ministry of Merchant Marine approved a set of rules for the Northern Sea Route to ensure both the safe navigation of arctic ships and the protection of the marine environment. The *Regulations for Navigation on the Seaways of the Northern Sea Route* have been in force since 1 July 1991.² They define the route as the wa-

terway stretching from the straits at the southern tip of the island of Novaya Zemlya east to the Bering Strait. The Murmansk Shipping Company in the western regions and the Far East Shipping Company (headquartered in Vladivostok) in the eastern reaches of the route will provide icebreaking and other services. Special rules address notification of transit, payment of fees, certificates of financial security, control of navigation, requirements for vessels and masters, state pilots, and compulsory icebreaker assistance in selected, narrow straits known for difficult ice conditions (with a required state ice pilot on board). Essentially, the *Regulations* allow for the navigation of ships from all maritime nations along the route, provided they meet various operational, technical, and financial requirements. Interestingly, today only a handful of ships in the Western world could meet the design and technical standards for arctic ships as outlined in detail by the Administration of the Northern Sea Route.

The opening of the Russian Arctic and the Northern Sea Route to multinational use is an intriguing and complex challenge for international shipping. One suggestion is that the regional linkages men-



tioned here may well determine the short-term level of shipping, particularly in the western regions of the route. Opening more ports to foreign shippers along the entire length of the route will be critical in stimulating the economic linkages to Europe in the west and to the Pacific

Basin at large in the east. Because of the severe economic crisis prevailing throughout the Russian Federation—particularly in the Russian North—foreign investments and capital will be required to improve and build an infrastructure for effective and efficient maritime com-

merce. International cooperation in terms of environmental protection, technology transfer, and maritime commerce will be the key to future success in the utilization of the Northern Sea Route.

Member of Historic Antarctic Expedition to Speak at Woodinville

by Anna Dwyer

The Woodinville Weekly/The Northlake News/The Valley View, April 12, 1993

Recent visitors found it a ghost town like no other. Nearly 50 years of battering winds, ice and snow had taken their toll on the three buildings still standing which represented the first permanent American base on the continent of Antarctica.

But 44 years ago the encampment, called East Base, was carved out of the ice and terrain by 26 true explorers who made history as they established the first research station there, under the long distance guidance of the legendary Admiral Byrd who was too ill to join the expedition and relayed his instructions via wireless radio.

The youngest member of that expedition was Herwil Bryant, only 23 years old when he was hired by the Smithsonian to serve as the paid biologist on the expedition.

He has never forgotten the memories of that experience and will be sharing his adventures with area children during a special presentation at the Woodinville Library on Saturday, April 17, at 2 p.m. The presentation is geared for ages 8 and up.

"I was working as a ranger naturalist in the Rocky Mountain National park. I applied as a volunteer and didn't hear anything back. Then one day I was notified that I had been selected by the Smithsonian as a junior biologist for the expedition," he said. He got paid a whopping \$2,000 a year for going where no man had gone before.

The expedition was originally intended to be privately funded by Admiral Byrd. However, the U.S. government took over sponsorship, under the auspices of the Department of the Interior and called it the U.S.

Antarctic Service Expedition, directly supervised by Admiral Byrd. Although Byrd accompanied the men on ship, he could not directly participate in the exploration because of health problems caused by previous expeditions, according to Bryant.

Bryant and others in the party boarded the *Bear*, a classic wooden sailing ship which had been recommissioned by the Navy for this voyage. It took seven weeks to sail from Boston Harbor to Antarctica.

"It was really amazing being on board a historic ship under full sail. The *Bear* was built in 1874 and had also been used for Arctic exploration," said Bryant. [See back cover, Alfred Johnson article, page 3; and "Reclaiming U.S. Antarctic History," page 10.]

Everyone pitched in to do whatever had to be done to build the camp and to survive. One of Bryant's tasks was to make 6,700 bricks of pemmican to feed the sled dogs, who were essential partners in the exploration of the continent.

"We had to do everything from scratch. We had to kill the seals, skin them and extract the blubber, which is an essential ingredient in the pemmican. This was mixed with cereals and vitamins we had brought with us to make a nutritious food for the dogs, he explained.

They also sampled local cuisine.

"We tried penguin meat. It's not very good. But penguin eggs were quite tasty. The 'white' of a penguin egg is actually green. Seal steaks were gamey but good," he recalled.

Antarctica was a wonderland of discovery for the team. As the naturalist, Bryant collected both living and dead specimens, with the goal of bringing as many back as possible. One of his favorites was a petrel, a beautiful white bird found there.

Hopes of bringing these priceless specimens back were dashed when President Roosevelt ordered the emergency evacuation of the base at the outbreak of World War II.

"The original plan had been to establish a permanent base and rotate crews through there each year. When the war broke out, we were ordered to leave, taking only items needed for survival and specimens that could fit in our pockets," Bryant said.

Evacuation turned out to be a life-threatening event. The ships couldn't get near the camp because of ice, and the camp's only plane, a small bi-plane, didn't have the range to reach the ships.

"The ships waited almost two months, but couldn't get anywhere near the East Base. The ice was getting thicker. We were making plans to stay on, without supplies, knowing we'd have to eat penguins and seals to survive." The *Northstar* turned back while the *Bear* said it would wait out one more storm. After that storm, the ice loosened up and the *Bear* got within range of the bi-plane. Once again, the *Bear* had come to the rescue of American explorers, having also saved the Greeley expedition of the Arctic in the 1880s.

Each member of the expedition boarded the plane carrying survival clothing in a bundle. There was a sense of disappointment that so much of their discovery had been left behind, with an uncertain future for the exploration of Antarctica.

Bryant has returned to Antarctica during recent years serving as a tour guide on three cruises to the area.

"The thing I noticed most was that there are more penguins and fewer whales. It makes sense since they both eat krill," he said.

Reclaiming U.S. antarctic history: The restoration of East Base, Stonington Island

East Base is the oldest remaining U.S. research station in the Antarctic. The base, built by the U.S. Antarctic Service Expedition (USASE) under Admiral Richard E. Byrd, was one of two stations built in 1940. The other base, West Base—better known as Little America III—was built on the Ross Ice Shelf near Roosevelt Island. This station later disappeared when the ice shelf calved. Although others have visited or used East Base, the station was last used by an American expedition, the privately financed Ronne Antarctic Research Expedition, in 1947–1948.

At the 1989 Antarctic Treaty Consultative Meeting, representatives approved a recommendation that added East Base to the list of historic monuments protected by the Antarctic Treaty. The area of the historic site, as defined by this recommendation, is "approximately 1,000 meters in the north-south direction (from the beach to Northeast Glacier adjacent to Back Bay) and approximately 500 meters in the east-west directions." (Recommendation XV-12)

U.S. Antarctic Service and Finn Ronne expeditions

USASE personnel under the direction of Richard B. Black erected the base's three main buildings and several smaller structures in 1940. The main buildings were wooden pre-fabricated structures. The largest of the buildings contained the galley at the north end and Admiral Black's quarters and the sick bay at the south end; these were connected by a corridor off of which were 10 cubicles. Other buildings constructed by USASE personnel

were a science building with a meteorological tower, a machine shop, a small hut, a taxidermy shop, and a storage hut. Twenty of the 26 men in the expedition lived in the 10 cubicles off the main building's corridor; Finn Ronne (who also participated in this expedition) and one other man lived in the small hut; and the radio operator and the expedition meteorologist lived in spaces in the science building. The expedition doctor had his quarters in the main building in the sick bay.

Although the expedition's original plan called for the 26-man crew to be relieved in 1941 and for the station's continued use, the uncertainties of World War II led the U.S. government to decide that both East Base and West Base should

be evacuated in 1941. After picking up personnel at the Ross Ice Shelf camp, the expedition's ships, *Bear* and *North Star*, sailed to the Peninsula region to evacuate East Base. Reaching Marguerite Bay on 24 February, the ships found the pack ice impenetrable. By 15 March ice conditions had not improved, so *North Star* returned to Chile for supplies in case the base could not be evacuated and the crew had to winter a second year. *Bear* traveled south to do reconnaissance work.

When *Bear* reached the Biscoe Islands, still 195 kilometers (120 miles) north of East Base, the expedition found a suitable site on low, snow-covered Watkins Island (known then as Mikkelsen Island) to build an air strip. On 22 March 1941 aboard the expedition's Condor bi-plane, USASE personnel hastily abandoned East Base and flew to Watkins Island. In two trips all personnel, data, and some specimens were evacuated; however, because of the weight limitations of the bi-plane, the expedition was forced to leave all other equipment, supplies, specimens, and less valuable records. A note was left on the wall of the science building, explaining that these materials belonged either to the U.S. government or to USAS expeditioners and that the U.S. Department of Interior should be notified to arrange for the return of these materials to the United States.

East Base was reoccupied after World War II during the 1947–1948 austral summer by the privately financed Ronne Antarctic Research Expedition (RARE) under the leadership of Finn Ronne. Among the 23 members of the RARE expedition were a Boy Scout (Arthur Owen) and the first two women ever to winter in Antarctica—J. Edith Ronne, Finn Ronne's wife, and Jennie Darlington, the recent bride of Harry Darlington III, the chief pilot.

The base had been vandalized before Ronne arrived in March 1947, and personal belongings, tools, and scientific and medical equipment had been scattered around the site. By then most of this material had already been covered by snow and ice. After the RARE expedition, British Antarctic Survey teams, who had a base nearby on Stonington Island, converted the main building into a storehouse for seal carcasses used as dog food.

Restoration of an historic monument

1990–1991 restoration evaluation. Following the 1989 declaration of the base as an historic monument, the National Science Foundation's Division of Polar Programs (DPP) sent two National Park Service (NPS) cultural resource specialists (Catherine Holder Blee and Robert L. Spude) to East Base to assess the buildings and other cultural remains at the site and to prepare a management plan.

The NPS specialists found that the site had retained surprising integrity. The three wooden, pre-fabricated buildings were still standing, as were a spare airplane engine, a U.S. Army light tank, and a tractor. They found two large food caches (mostly canned goods in wooden crates), a cache of personal survival gear probably used by Finn Ronne's expedition, and two extensive domestic garbage dumps largely untouched by either vandalism or deterioration. A number of lesser dumps and caches were also recorded.

Several items suggest that most of the material at the site dates from the U.S. Antarctic Service Expedition—a duffle bag and tool chest labeled with the names of expedition members; the printed consignee addressed on the food crates; extensive remains of useable but discarded chemical, medicine, and food bottles in the dumps; and the engraved names of dogs on metal plaques, probably affixed to runs or kennels.

1991–1992 site restoration. Between 21 February and 5 March 1992, a team of eight men returned to East Base to collect artifacts systematically, to remove from



East Base, Stonington Island, was built by the U.S. Antarctic Service Expedition in 1940. The oldest U.S. station in Antarctica, East Base was declared an historic monument by representatives of the Antarctic Treaty Consultative Parties in 1989.

the site potentially hazardous materials, and to stabilize the buildings.

Two of the team members were from the British Antarctic Survey (BAS) base Rothera, about 80 kilometers (50 miles) from East Base. At the invitation of BAS, the team lived in an old British Station on Stonington Island, Base E, which was closed in 1975 but is still maintained as a refuge.

According to archeologist Noel Broadbent, leader of the 1992 team and DPP program manager, "A fascinating assortment of items have been preserved despite the ravages of 50 years of antarctic weather." Although metal objects—cases of canned food, tools, and vehicles, including a World War I vintage tank and a small tractor—are badly rusted, books, papers, clothing, objects of wood, leather and rubber were found remarkably well preserved. Playing cards were found under the floorboards of the science lab, and an *American Digest* magazine from July 1938 was found lying out in the open, still readable. Leather dog collars with name tags—"Kelley" and "Chitma"—were found. A Woolworth size-15 shirt was found still pinned and unused. Two metal name plates of expedition members were uncovered as

well—C.W. Sharbonneau, carpenter in the 1940–1941 expedition, and Bob Dodson, of the 1947–1948 expedition.

The hazardous materials, described by Blee and Spude, were excavated and removed from the site. Among these were a large assortment of medical supplies (such as pills, syringes, and drugs of various kinds), old helium-gas cylinders used for weather balloons, batteries, shotgun shells (174 of them), and asbestos from old stove plates. These hazardous substances were containerized and removed; the old medical wastes were accepted by BAS for processing. Unidentified, potentially hazardous substances were labeled and also containerized. All of these hazardous waste materials were collected and transported from the site to Palmer Station by the chartered ship *Erebus*. The remaining nonhazardous wastes were removed via *Erebus* from the Treaty area.

The areas around the buildings were cleaned, and gravel and rock pathways were prepared. Signs in English, French, Spanish, and Russian (the official languages of the Antarctic Treaty) were placed on each building to notify visitors of the historic status of East Base.

Inside the science lab, an interpretive display panel with photos from the first expedition was installed. A handout with more detailed information and a visitors' log were left in the building together with displays of artifacts found at the site.

"There is growing support for the preservation of historic sites in the Antarctic," Broadbent said. "We hope that there will be growing international collaboration in this endeavor."

The East Base project was incorporated into the National Science Foundation's Safety, Environment, and Health Initiative for U.S. antarctic facilities. Broadbent has suggested that the clean-up of old bases and their historic preservation can go hand in hand. "While sites like East Base are cleared of hazardous materials," he said, "a valuable record of scientific research and researchers is revealed. Protection of these historic resources is as important as the protection of the natural environment."

—Noel Broadbent, Polar Coordination and Information Section, Division of Polar Programs, National Science Foundation, and Catherine Holder Blee and Robert L. Spude, U.S. National Park Service.

Dog Sleds Have Had Long Run in Maker's Life

by Paul Tolme

Rochester, N.H.

As mushers head across Alaska in the 21st Iditarod Trail Sled Dog Race, it's not hard to get Ed Moody rambling about the early days of racing and his adventures in Antarctica.

Out come the photo albums, filled with snapshots and news clippings of racers and history makers.

In the 1930s, Moody ferried supplies by dog sled into Antarctica for American explorer Adm. Richard Byrd. Moody, best known for making sleds, is in the record books for making one that won the first 1,100-mile Iditarod.

"A smart man never carries on his back what he can put on a sled," said Moody, 82.

He has been making sleds for 70 years and has devoted clientele of mushers in Alaska, as well as in Scandinavia and Japan. At his peak, Moody turned out more than 70 sleds a year.

His production has decreased to about 30 annually in recent years, partly because of a bad hip that hampers his navigation through his sawdust-filled workshop. Despite the

injury, Moody regularly scales a ladder in the shop, scampers around the attic and declines offers of help in lifting sleds.

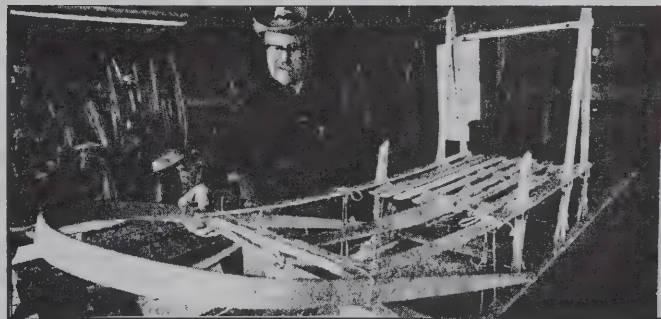
Moody, a stocky man with sandpaper-like hands and a handlebar mustache, works in a shed that "so closely resembles a city dump, you need a geography lesson to know where everything is." He lives in Rochester with his wife, Dot, 75.

Moody has no idea how many sleds he has built and declines to guess. He does know that he can't turn them out fast enough, at a cost of \$500 apiece.

"I have a reputation of being one of the world's best," said Moody. "Of course, I don't say that."

He does no advertising—his clients must seek him out.

Cindy Molburg, publisher of *Team and Trail*, a monthly sledding newsletter devoted to sledding, estimates there are about 35 sled-makers in



Ed Moody works on a sled in his workshop in Rochester, N.H.

North America, many of whom copy Moody's handiwork.

Moody combines traditional techniques with modern technology. Over the years he has replaced leather with nylon, and some of his designs include plastic runners which, he says, are faster.

One of Moody's proudest accomplishments is making the sled used in 1973 to win the first Iditarod. He has no sleds in this year's race, which began Saturday; top racers now are sponsored and their equipment is donated, something Moody can't afford to do.

Return to the Arctic and on to the Pole

By Robert Gleason, W3KW
3734 Ramsgate Dr
Annapolis, MD 21403

In 1929 I was the radio operator on the small three-masted schooner *Nanuk* on a voyage into the Siberian Arctic. *Nanuk* was caught in the ice and forced to winter at North Cape (since renamed Cape Schmidt) just south of Wrangell Island. I wrote a book about it, telling of my use of ham radio when we were otherwise out of communications range, about the airplanes that came to us from Alaska, and the international search for famous Arctic pilot Carl Ben Eielson. The book tells how a small band of men fought the Arctic with a wooden ship and small single-engine airplanes after being trapped on a hazardous venture into that region.

Now, 63 years later, I couldn't resist the opportunity to go as a passenger on a big steel nuclear-powered Russian icebreaker, which would not only take me back to the same Arctic coast, but on north to the geographic North Pole! Furthermore, the trip would be from Providnya, Siberia, to Murmansk in European Russia, and then I'd return home—Around the World in 24 Days.

On August 10, I flew to Anchorage, Alaska, and on August 12, over the Bering Sea to Providnya. After being cleared into Russia, 91 passengers were flown out by helicopter and landed on the stern of the 500-foot, 75,000-horsepower icebreaker *Sovetskiy Soyuz* ("Soviet Union"), anchored in the bay. This great ship would be our home for 21 days.

All Ears

I had discarded thoughts of taking a ham transceiver, but I did bring my portable short-wave receiver. We set up transmit schedules daily on 14010 kHz at 0000 UTC with Oiva Simila, N3OS, in Winchester, Virginia;



Russian Icebreaker *Sovetskiy Soyuz*, operated by the Murmansk Shipping Company.

George Boring Jr, W3KS, in Annapolis, Maryland; and my old WWII Air Force colleague Jules Wenglare, W6YO, in Delano, California. Meanwhile, Oiva, Jules and I were trying to contact Russian hams in the Arctic to alert them that I was coming. Among those we got were Yuri Kozlanko, UAØKBB, at Lavrentiya Bay; Andy Polikarpov, UAØKG/UKØKAA, on Wrangell Island; Rummyancev Yuri, UAØKZ, at Pevek; RA3MZ/UAØ, at North Cape; UZØBWL, at Cape Chelyuskin; and UAØQGR, on the Kolyma River.

It was necessary to be on deck to use my receiver on the steel ship. My first chance to do this was when we anchored north of Big Diomed Island in the Bering Strait on August 14. Jules was S5 here and I heard Oiva call him. And WIAW puts a strong signal into the Arctic on 14 MHz.

Next, we stopped at Uelen, on the north shore of East Cape, also called Cape Dezhnev, the easternmost tip of Asia. I had flown there with Joe Crosson in 1934 when we were with Pan Am Airways in Alaska. A small town had replaced the tiny village of 1934, with many Chuksi and Russian families walking on their "Main Street" on that Saturday night. Our helicopter landing on the shore of the lagoon was near where Joe and I had tied up our float plane.

When we reached Wrangell Island, I went ashore by helicopter to find Andy. At the southern tip of Wrangell, the Russians had a large village, still occupied by polar-research people, including biologists studying polar bears that raise their young in snow banks on the island. Many buildings were deserted, but I went around banging on doors of the ones

with any sort of antennas and waving my QSL card trying to find Andy. A biologist thought he might be down in the buildings on the spit below the village, but I didn't venture there, as it was a steep climb down the bluff and I didn't want to miss my helicopter back to the ship, which was anchored a few miles offshore. I gave my QSL card to the biologist and left on the next-to-last helicopter. When the last one came back, it brought me Andy's QSL card and a photo of him and his wife, Tanya, UZØKWA; his note said he'd soon be moving to Magadan and would be on the air from there. I just missed him!

Gaining a Voice

As we went north via the New Siberian Islands, I was getting better acquainted with the ship's officers, including Vladimir Lebedev, the chief radio officer. There were five radio/radar/electronic people, unfortunately none of them hams, but they were most gracious to me and my cabin mate, Ken Bastholm, W4JFT, of Miami, Florida. They tried to give me an antenna for my receiver at first, then said I should use one of theirs, which I did with fine results. As we continued north and west, frequently setting the clocks back an hour, I listened for my friends in the middle of the night.

The day before we got to the Pole, Vladimir surprised me by saying he'd give me a transmitter to answer Jules, who was coming in strong and sending blind to me. It took several minutes to warm up the transmitter and by then Jules had quit. I worked Allen Moore, W9JJX, in Ft Wayne, Indiana, and told him where I was, and asked him to tell Jules that I'd be on the next day.

Sure enough, at the Pole on August 23,

Jules was coming through with an S5 signal, but sounding hollow. When he heard W3KW replying, he didn't believe me at first, but I quickly convinced him! I suggested to Vladimir that he send "Greetings to all hams from the Russian icebreaker *Sovetskiy Soyuz* at the North Pole," which he did. I worked Jules for some time using the right paddle of some kind of iambic keyer as a straight key; slow, but passable. Jules recorded some of our QSO. I'm most appreciative of the Russians for letting me use the transmitter for W3KW/MM at the North Pole. I hadn't applied for permission to operate W3KW in Russia.

While we were cruising among the Franz Josef Land islands, the captain arranged to meet another of their nuclear icebreakers, the *Vaygach*, which was escorting freighters. The captains stopped their ships about 300 yards apart in heavy ice, and all who wished to go were taken by helicopter to the *Vaygach* to inspect the newer vessel. I chose not to go and was on the bridge when a stranger appeared bearing his QSL card and looking for me: It was Alex Gazilov, 4K2OKV/UA1OKV, from Heyss Island, Franz Josef Land! He presented me with an unusual spherical metallic rock from that island and I gave him my pocketknife.

The ships may have improved in six decades, but in the seas north of Siberia, ham radio and the weather are still cool!

The Ship and the Trip

This year, in this area, the sea was unusually open; there was little ice along the coast where we had been unable to travel in 1929 and we didn't encounter heavy ice until we were north of Wrangell Island. Our course to and from the Pole had been carefully selected by the "ice pilot," who had just flown from Murmansk to the Pole and then down to Pevek; we picked him up by helicopter off Cape Shelagski. The course is plotted to avoid as much multiyear ice as possible, as multiyear ice is often 30-40 feet thick. In this powerful icebreaker, we cruised through most ice at 7-13 knots, with lots of crashing, banging and shuddering, at times, somewhat uncomfortably, but ahead of schedule. The ship often stopped so we could see polar bears and walrus. We were ferried ashore by two helicopters to various landing places to see historic sites, animals and birds.

The ship (to me, an EE) was marvelous. Two nuclear reactors driving steam turbines provided more than 60,000 kilowatts of ac for everything. The three big propeller motors used dc at 1000 volts, which was supplied by huge selenium rectifiers and large copper busbars. The motors were individually remote controlled from several synchronized positions and can go from full ahead to full reverse in 90 seconds! I was told that this 20,000-ton ship could be stopped from its cruising speed of 19 knots in 500 meters. The ice-cutting propeller blades are 18 feet in diameter.

We were taken on tours of the large, complicated control room, the propeller-motor rooms and even the nuclear reactor compartment. We were allowed on the 90-foot bridge at all times and could go almost anywhere on the great ship. The two helicopters and the large Zodiac boats operated flawlessly. Personally, I preferred the smaller helicopter, where I was often privileged to ride in the copilot's seat.

The radio shack was made up of five rooms with HF, MF, VHF, Telex, fax and SATCOM equipment. Satellite service wasn't possible above 80° north latitude, but MF/HF services were used to contact other ships, and their Arctic coastal stations could always be depended on, as we did in 1929. Below 80°, satellite service was excellent using an Indian Ocean satellite; you could even make a call home with your credit card.

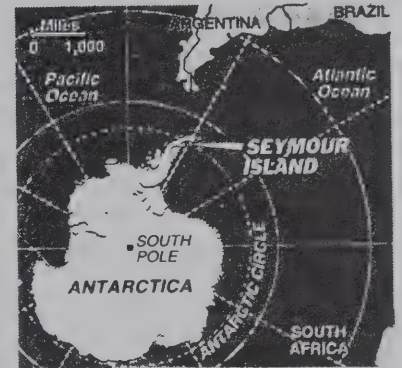
The *Sovetskiy Soyuz* is a working icebreaker used summer and winter to convoy ships on the Russian northern sea routes. She and her four sister ships are based in Murmansk. She was built in St Petersburg (then Leningrad) and hasn't been refueled in four years. Distilling her own water, she's self-sufficient for seven months. Mistress of the Arctic Ocean! A great peaceful use of nuclear power at sea.

A final word about the Russian crew. They were great! Most had been on the ship since commissioning and hoped her name would not be changed. Captain Gorshkovskiy, Chief Engineer Pilyavev, and all the officers and crew were always gracious and kind to their 91 passengers.

The crew participated in the celebration at the Pole and in many other activities. It was a pleasure to be with them and we wish them well in the challenge ahead.



Antarctic Hooved Animals Left Fossils



Evidence has been found that hooved animals, today represented by such species as the horse, pig, and antelope, once roamed the Antarctic landscape, now buried in ice.

The fossils were found last year on Seymour Island, off the tip of the Antarctic Peninsula, by scientists from the Argentine Antarctic Institute, based in Buenos Aires.

The discoveries were of an extinct hooved animal, or ungulate, the size of a small horse. It seems to have closely resembled the guanaco, which now inhabits the southern Andes and is a close relative of the llama and camel. The discovery further demonstrates the close affinity between the inhabitants of southern South America and Antarctica 40 million years ago, when those continents were joined.

The site has been an extraordinarily rich source of fossils. It had already produced the remains of rat-sized marsupials, showing that the ancestors of kangaroos, koala bears and wallabies resembled the guanaco. They are important because they record for the first time the presence of big to medium-sized herbivorous mammals in Antarctica. This, they added, implies the existence of one community of animals where there are now two separate continents.

The fossil mine on Seymour Island is a tall bluff. The marsupial remains have been found near the top; ungulates were deposited at a middle level. The initial Seymour Island discovery was made in 1902 by Otto Nordenskjöld and his Swedish companions. They included the fossils of dozens of plant and tree species, including figs, laurel, beech, sequoia, and a variety of evergreens, some of which towered 150 feet.

Remember when . . .

The Two-Pole Dream Comes True

by Wayne W. Parrish, November 17, 1965

AT LONG LAST an airplane has flown around the world via both Poles on a single flight.

Historic as it was, the event was so routine in execution that one wonders that it wasn't achieved years ago. It was just about the only remaining significant epic of the subsonic age.

In these times of space exploits, with astronauts circling the globe in an hour and a half, it was a little difficult to excite a great deal of public interest. And yet this two-pole "first" proved to be an extraordinarily fine tribute to the jet engine and the manned airplane.

Many times in the past such a flight has been dreamed about, planned and engineered. But nobody ever got around to doing it until two veteran TWA pilots, Fred L. Austin and Harrison Finch, kept at the goal with determination until a willing sponsor was found to cover the direct costs of about \$180,000.

The willing sponsor was the Rockwell-Standard Corp. of Pittsburgh (Aero Commander, etc.) and the happiest man on the entire trip from first to last was 76-year-old Col. W. F. Rockwell, board chairman.



Named the Pole Cat, the vehicle was a Flying Tiger Boeing 707-320G, fresh out of Seattle except for one round trip to Saigon. Engines were four Pratt and Whitney JT3D-3B jets developing 18,000 lb./th. ea. Elapsed time was 62 hr. 27 min., but perhaps more impressive was the flying time of 51 hr. 27 min.

Departing Honolulu Nov. 14, the Pole Cat flew north over the North Pole to London, stopped for more fuel in Lisbon, and again to refuel in Buenos Aires, then flew south over the South Pole and down to Christchurch, N.Z., and returned to Honolulu Nov. 17. Some years hence a long-range supersonic airplane undoubtedly will shatter the Pole Cat's record but for some time it will remain solid.



(Above left) Termination of the round-the-world flight at Honolulu. (USAF photo) (Above right) Returning to Burbank: Left to right at bottom, Captains Harrison Finch and Fred Austin, and, top, Captains Jack Martin and Bob Buck.



Three seatmates en route: Lowell Thomas Jr., polar expert and retired USAF Col. Bernt Balchen (standing) and Wayne W. Parrish.

The Pole Cat Weighed Plenty

Gross Takeoff Weights From:	Lb.
Palm Springs	253,933
Honolulu	352,610
London	273,333
Lisbon	329,733
Buenos Aires	324,333*
Christchurch	285,333
Honolulu (to Burbank)	241,333

* Although this was the longest leg, weight of fuel was lighter due to higher spring temperature at Buenos Aires.

A Hungry Pole Cat

With cabin tanks installed by Air Logistics, Inc., containing 4000 gal., the Pole Cat consumed a total of 117,354 gal. of aviation kerosene starting at Palm Springs and ending at Burbank. Total capacity was 27,855 gal., filled for the Honolulu-London leg.

Here is the fuel record:

Left Palm Springs with 16,200 gal.

Added 23,610 gal. at Honolulu

Added 16,607 gal. at London

Added 14,300 gal. at Lisbon

Added 24,344 gal. at Buenos Aires

Added 18,600 gal. at Christchurch

Added 11,393 gal. at Honolulu (for Burbank)

The actual round-the-world flight, Honolulu-Honolulu, subtracting 3500 gal. remaining at Honolulu from Christchurch, consumed 98,206 gal.

Eight World Records Claimed

The National Aeronautics Association, represented on the flight by Edward C. Sweeney, president, and Bart Locanthi, timer, have certified to the Federation Aeronautique Internationale the following eight records (all elapsed times) claimed by the Pole Cat:

Around the world—both poles	62:27 hr.	415 mph
North to South Pole	34:46 hr.	357 mph
Honolulu to London via North Pole	13:54 hr.	520 mph
Buenos Aires to Christchurch via South Pole	14:17 hr.	431 mph
Christchurch to Honolulu	9:01 hr.	539 mph
London to Buenos Aires	16:41 hr.	416 mph
London to Lisbon	2:19 hr.	414 mph
Lisbon to Buenos Aires	11:56 hr.	497 mph

Here's the Pole Cat Record

Leg	Statute Miles	Flight Time (Hr.)	Ground time at:
Burbank-Palm Springs Ferry		:44	
Palm Springs-Honolulu	2695	6:27	HON—2:46 hr.
Honolulu-London	7407	13:54	LON—3:24 hr.
London-Lisbon	1070	2:19	LIS—2:25 hr.
Lisbon-Buenos Aires	6140	11:57	BA—2:59 hr.
BA-Christchurch	7027	14:18	CC—2:11 hr.
CC-Honolulu	4856	9:01	HON—3:00 hr.
HON-Burbank	2585	4:27	

Total globe-circling flight time, HON-HON: 51:27 hr.
Total elapsed time, HON-HON: 62:27 hr.
Total Statute Mileage, HON-HON: 26,500
Total Statute Mileage, Burbank-Burbank: 31,980
Total elapsed time, Burbank-Burbank: about 4 days, 10 hr. (106 hr.)

Trans-Antarctic Medical Mission



To save an injured man in Antarctica, Lt. Harrison Heyssel had to pilot his LC-130—a prop-cargo aircraft on skis, with a 10-man crew—on a rescue mission into a freezing, icy wasteland.

Antarctic Journal

Medical facilities at all antarctic stations are limited. Although these facilities vary greatly from station to station, in all cases people with serious injuries or illnesses that require special attention or that are life-threatening cannot be treated in Antarctica. Because of this, the United States, as well as other countries with aircraft capable of making long-distance flights, has often been called upon by other countries that have antarctic research programs to assist in medical emergencies.

On 12 November 1992 the National Science Foundation representative at McMurdo Station received a radio message requesting medical assistance from the South African station SANAE, which is on the other side of the continent about 3,900 kilometers from Ross Island. At a nearby South African summer camp Sarie Marais (72°2' S 2°48' W) a member of their expedition, 31-year-old John Hattingh, had broken his leg in a snowmobile accident. The South African station's medical personnel informed U.S. personnel that without immediate attention they believed the man could lose his leg. They also said that without proper medical facilities the injury might become life-threatening.

Just after midnight on 12 November a ski-equipped Hercules (LC-130) airplane took off from McMurdo's sea-ice runway enroute to Amundsen-Scott South Pole Station and Sarie Marais. About an hour later a second LC-130 left McMurdo Station for the South Pole. The first LC-130, which had a medical corpsman onboard as part of its 10-man crew, refueled at the U.S. station at the South Pole and continued on

to the South African camp in Queen Maud Land. The second LC-130 remained at the South Pole on stand-by.

The U.S. airplane arrived at Sarie Marais in the early morning of 13 November. The injured South African was examined, stabilized, and moved to the airplane for the return flight to McMurdo Station and onward to Christchurch, New Zealand.

Because the snow surface where the LC-130 had landed was rough and unprepared, ten attempts were made before it could take off. During one of these attempts the airplane was damaged; consequently, when they reached the South Pole, the South African expeditioner was transferred to the second airplane, which flew him to McMurdo.

At McMurdo Station the U.S. Navy Force Medical Officer determined that Hattingh could safely make the trip to Christchurch without further medical attention. He was then moved to a third ski-equipped airplane, flown by the 109th Air National Guard for the last leg of journey. Leaving Antarctica at 5:00 pm (McMurdo local time) on 13 November, the airplane arrived in the early morning on 14 November in Christchurch, where the injured man was transported to the local hospital for treatment.



"Probably that Byrd crowd again"

Charles Alston

Book Reviews

August Howard used to publish book reviews in *The Polar Times*. We plan to carry on the tradition. Those of you who have published and would like an independent opinion to help you with marketing, please contact us directly. We will need two copies of the book—one for our library and one for a book reviewer whom we select from our membership. The review will be carried in the following issue of *The Polar Times*.

Volcano is Baking Under South Pole.

Los Angeles Times

Scientists seeking the source of voluminous ice streams in West Antarctica have discovered a volcano baking under nearly a mile of solid ice near the South Pole, marking the first time an active volcano has been found under an ice sheet.

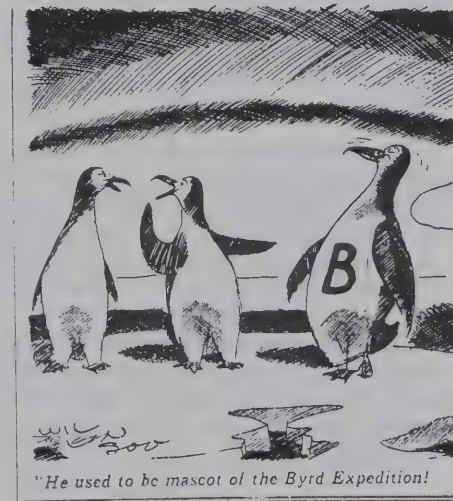
Heat from the volcano may be the source of water that is soaking the ground and lubricating the glaciers' relatively rapid slide down the Whitmore Mountains, across the West Antarctic ice sheet, through the Ross Ice Shelf, and eventually into the Pacific Ocean.

The West Antarctic ice sheet is of particular interest to scientists because it is the only ice sheet in the world that crosses round that lies below sea level, a feature that makes it inherently unstable.

They are also interested in the effect of global warming on Antarctic ice and the possibility of a catastrophic collapse of the sheet.

Such a collapse, which scientists believe is unlikely, would release enough water into the ocean to raise global sea levels by more than 18 feet, inundating many of the low-lying coastal areas where most of the planet's population has settled.

"Catastrophe is pretty remote," said Steven M. Hodge of the U.S. Geological Survey and a co-author of an article on the Antarctic volcano to be published in the journal *Nature*.



The Mount Vaughan Antarctic Expedition

The Mount Vaughan Antarctic expedition is off and running!

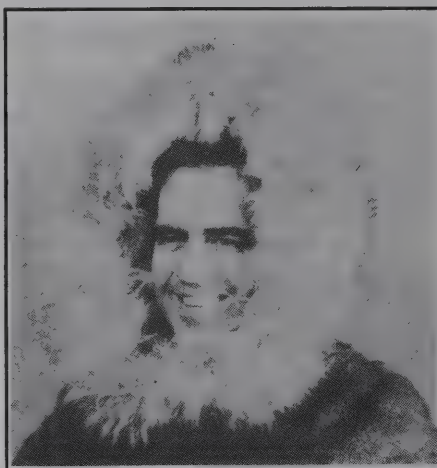
The expedition is very fortunate to be on its way. Norman Vaughan, the MVAE team members, dogs, and the National Geographic film crew will be going across uncharted territory with the last two dog teams permitted on the Antarctic continent. They will have a grand celebration on the top of Mount Vaughan for Norman Vaughan's 88th birthday.

The group, led by Vaughan, spent the last week frantically figuring fuel, flights and weights. In order to save money and streamline logistics, the weight of the expedition was reduced to 14,830 pounds. This includes people and dogs. The weight of the food and gear will be about 13,000 pounds, compared to the originally planned weight of 20,000+ pounds.

The expedition is short \$150,000, so the team has revamped its plans. Michael Funke (the National Geographic Film Crew guide), Dr. Ken Zafren and Brian Horner will drive the two National Geographic snow machines, each loaded with 2,415 pounds of gear, from Camp DeGanahl (the expedition's communication base camp 80 degrees latitude, 80 degrees longitude) 432 miles across uncharted territory to Camp Dinny. The rest of the team, dogs, and gear will arrive at Camp Dinny via a DC 3 on skis.

The team will travel 182 miles over uncharted territory for approximately 13 days. They will then turn southeast and aim their sights for the Goodale Glacier. This will be 77 miles (five days). A base camp will be set up at the Goodale Glacier. From here, it is 44 miles to the summit of Mount Vaughan. The team will summit Mount Vaughan, Dec. 19, via the Vaughan Glacier, and return to the base camp at the foot of Goodale Glacier. This should take about six days.

This plan allocates 12 days for setting up the base camp, getting the dogs acclimated, and provides for a number of bad weather days. The radio operators, dogs and dog handlers will be flown by a DC 6 to Camp deGanahl by November 15. The rest of the group will not be far behind. The story of the expedition will be carried in the Spring 1994 edition of *The Polar Times*—we offer our best wishes to Norman and his team in this exciting adventure.



NORMAN VAUGHAN IN 1929 AND TODAY—Vaughan, chief dog sled driver of Admiral Richard E. Byrd's first Antarctic expedition in 1929, is again mushing dogs across the Antarctic continent. He plans to scale Mt. Vaughan, named after him, and celebrate on the summit on Dec. 19, 1993—his birthday.

Reunions

Through the grapevine, we know of several polar reunions in the planning. For instance, there was a Greenland Patrol Reunion on Oct. 14, 1993, in Daytona Beach, Fla., and several Deep Freeze reunions in 1993. We would like to help.

If you are planning a reunion, let us know as soon as possible so we can publish the details in a timely fashion. Better still, we will publish "inquiries of interest" in a reunion for polar groups. Then, after the celebration, we will carry an article with the details of the get-together.

FLASH! Mount Vaughan Antarctic Expedition Crash UPDATE

Anchorage, Alaska, Nov. 30, 1993

Members of the Mount Vaughan Antarctic Expedition and crew from the chartered Allcair Air Transport DC-6 that crash-landed near Patriot Hills, Antarctica, on Nov. 25 have been rescued and are back in Punta Arenas, Chile. The expedition's veterinarian, Dr. Jerry Vanek of St. Paul, Minn., remains hospitalized in serious condition with a leg fracture, broken arm and facial fracture.

Dr. Ken Zafren, the M.V.A.E.'s team physician, and Brian Horner, the team's cold-weather survival expert, flew to the accident site from Punta Arenas, Chile, on a chartered Hercules C-130. The four DC-6 crew members, Vanek, radio operator George Menard of Trapper Creek, Alaska, dog handler Larry Grout of Anchorage, Alaska, dogs and salvaged gear were returned to Chile on Saturday evening, Nov. 27.

The DC-6 was nine miles short of the expedition's Antarctic base camp when the accident occurred. The chartered aircraft was making the first of eight trips necessary for hauling 95 barrels of fuel, team members, dogs and gear from Punta Arenas to the base camp near Patriot Hills. The cause of the accident is under investigation; however, it was reported that the weather conditions were deteriorating and pilot skill may have prevented fatalities.

Norman Vaughan and the M.V.A.E. team members will spend the next five days in Chile reassessing expedition objectives in terms of safety, time, and financial constraints. The expedition hopes to summit the mountain named in Vaughan's honor on Dec. 19, 1993, Vaughan's 88th birthday.

Scientists Unearth Bedrock Sample While Studying Glacier in Greenland

Pensacola News Journal, July 1993, Fairbanks, Alaska

Scientists studying glaciers by drilling through Greenland's ice cap stumbled onto unknown terrain when they hit bedrock.

Crews have worked since April in a white desert of ice to drill more than 10,000 feet through a glacier, collecting samples of ice as old as 250,000 years.

In the end they pulled up a sample of Crystalline bedrock they said is as exotic as rocks collected on the moon.

"To us, this was a dream" said Baxter Burton, assistant director of the University of Alaska at Fairbank's Polar Ice Coring Office.

"It's the first time this rock has ever been sampled," John J. Kelley, director

of the office, said. "We really don't know what to expect."

The project was originally scheduled to end when the drill passed through the bottom of the glacier. But after the scientists realized how close they were to bedrock, Fairbanks researchers developed a special diamond-and-steel drill bit, and scientists decided to try to pull up a sample of the rock.

The bit sank through a glacier and into the continent's bedrock in western Greenland.

The drilling crew said the bedrock appeared to contain quartz, garnets, and feldspar and other minerals. More bedrock samples will be taken before the project wraps up in the next few days.

The scientists are interested in glaciers because ice provides a faithful diary of climate. It captures and preserves everything from the grit of volcanic blasts to ancient atmospheric gases. Even periods of drought can be detected by studying glacial ice, scientists said. The Greenland glacier contains ice from two ice ages ago.

"This will let scientists plot a graph of how the earth's northern environment has changed," Kelley said Thursday from his Fairbanks office just hours after elated researchers cabled they had hit bedrock.

ED. NOTE: See article on "Schoolteacher," page 6 and "Deepest ice Core," page 4.

Polar Bear's Bones Raise Doubt About Established Ice Age Theory

Associated Press, Oslo, Norway—A polar bear that died about 60,000 years ago has challenged theories about the ice age because it seems to have lived in the wrong place at the wrong time.

Bones from the bear were discovered in Norway's Arctic. Scientists wonder what the bear and other animals were doing in that region at the time when it was supposed to be sealed under an icecap that would have made such life impossible.

"The most remarkable thing is that there were animals living there at all 60,000 years ago. That would mean that the area wasn't under an icecap as we believed," said zoologist Rolv Lie, of the University of Bergen.

Lie said geologists believe Norway was encased in ice during the last Glacial Epoch, beginning about 80,000 years ago and ending about 10,000 years ago.



But the bear bones—unearthed by construction workers in 1991 at Tysfjord, about 125 miles north of the Arctic Circle—cast doubt on that view.

Carbon-14 and uranium dating conducted this spring confirmed that the bear's remains are at least 42,000 years old—probably 60,000.

Lie and other scientists probing the chalk-filled Tysfjord grotto and nearby sites have found many clues about the Ice Age, including the bones of two other polar bears that were about 20,000 years old the jaw of a 32,000-year-old wolf, and the remains of seals, mice and ants.

"We have a lot of work left," said Lie. "But the abundance of animal and plant life suggests that north Norway was relatively warm for most or all of

the ice age. It could not have been continuously covered with ice as was believed."

The remains of the wolf, field mice, ants and tree pollen suggest an even warmer climate than the bear bones. "The wolf needs large prey like reindeer," Lie said. Reindeer, in turn, must be able to graze on bare ground.

"The summers must have been relatively warm and the winters not excessively cold, maybe like the northern coast of Greenland today," said Lie.

A team lead by Lie and geologist Stein-Erik Lauritzen is excavating the sites, partly to see if humans also lived in the area earlier than expected. Scientists now believe the first humans settled Norway about 12,000 years ago as the ice receded.

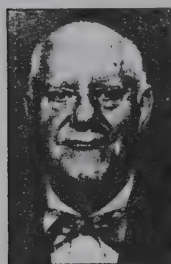
Happy Birthday! Jensen Arctic Museum

Western Oregon State College, 1990

As Oregonians endure the 90-degree temperatures this summer, the people of the Arctic are feeling their own heatwave — 65 to 72 degrees. So describes Professor Paul Jensen when he talks about the lifestyles and people depicted at the Jensen Arctic Museum, located on Church Street on the Western Oregon State College campus.

The occasion for one of "Dr. Paul's" stories presented itself last June when the museum, its founders and 100-plus volunteers celebrated the fifth anniversary of the museum's opening on the WOSC campus.

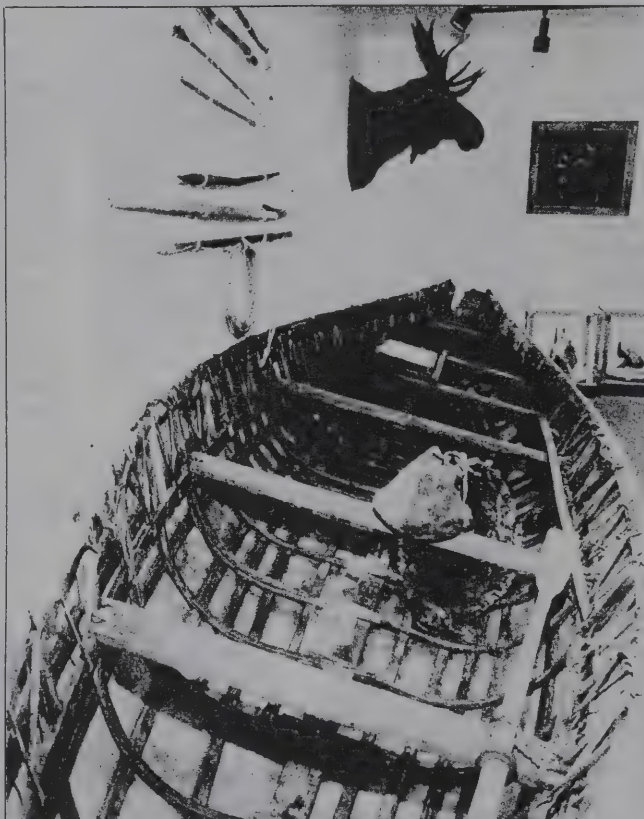
The anniversary was beneficial in reviewing where the museum has grown in the last few years and where



it's going, says Jensen. The event included a program of profiles by friends of the museum and discussions about its progress.

The Jensen Museum was dedicated on

June 25, 1985 after renovation of the old Thornbrue House on the WOSC campus. The museum contains the rare collection of native-Alaskan artifacts that are part of a 4,000-piece collection donated to the college by Jensen. He traveled and worked with the Eskimo people for three decades and felt an earnest need to preserve their culture.



Five Years Celebrated: Since 1985, more than 30,000 people have visited the Paul Jensen Arctic Museum to see the umiak and other artifacts.

"I could see that little by little they were losing their culture," Jensen

expressed. "And I felt a certain responsibility in trying to preserve

that. Because I felt that what they had was just wonderful."

Within the museum, a visitor will find ivory and stone tools, handmade hunting weapons, clothing, modes of transportation, forms of Eskimo housing, animal hides, and replicas of the animals who live in the wilderness. In addition, there are slides and displays depicting the lifestyles of the Eskimo people. A lucky visitor will receive a personal tour of the museum given by Jensen, complete with "Dr. Paul's" stories.

Since opening in 1985, 30,000 people from 47 U.S. states and 39 foreign countries have visited the museum. In addition, more than 7,000 children have taken scheduled field trips. The museum has more than 100 members in its fund-raising group, The Friends of the Paul Jensen Arctic Museum, and 32 docents, or volunteers, who regularly work at the museum.

Two years ago, the museum directors opened an addition featuring an arctic/tundra exhibit. Plans are underway to expand and move the museum again near the north entrance of the college.

Museum organizers will host their annual benefit Salmon Cookout on Sunday, Sept. 9 at 6 p.m. in the Pacific Room of the College Center. Tickets, priced at \$12, are available from the Office of College Relations, telephone 838-8281. Proceeds go toward support of the museum.

— Judy Corwin

Three killed, two injured in tragic helicopter accident

Antarctic Journal, March 1993

In the early evening of 13 October, a U.S. Navy HH-1N helicopter was returning to McMurdo Station after a routine flight to Cape Bird, about 40 kilometers from the station. At 6:25 p.m., Navy air operations reported that the helicopter was 10 minutes behind its anticipated arrival time. Attempts were made immediately, but unsuccessfully, to contact the helicopter via radio.

On board were the pilot, Lt. Cmdr. Ed Crews, his co-pilot, Lt. John Seralles, air crewman Ben Micou, and two passengers, New Zealanders Garth Varcoe and Terry Newport.

Three hours overdue, senior managers at McMurdo Station notified the

U.S./New Zealand Joint Antarctic Search and Rescue Team (JASRT) and requested that they begin an overland search. With the LC-130 serving as a communications link between them and McMurdo Station, eight team members—six aboard a *Haaglund* and two on a *Sprite*—left McMurdo Station for Cape Royds, following the anticipated flightline of the missing helicopter. Additional search-and-rescue (SAR) personnel and medical personnel took off aboard a second helicopter to assist in the search by air, despite the continuing poor weather along the search path.

Shortly before midnight, the crew aboard the second helicopter reported to McMurdo Station that they had made radio contact with LCDR Crews,

who told the crew that they were near Cap Royds at approximately 77° 27' S 166° 27' E, although poor visibility at the crash site prevented this helicopter from landing, about 15 minutes after midnight the first rescue helicopter launched from McMurdo was able to land; the first helicopter began moving SAR personnel from nearby Horse-shoe Bay to the crash site.

The SAR teams found that besides LCDR Crews, Lt. Seralles was alive, but injured. Both New Zealanders were dead, and the navy crewman Micou was missing. LCDR Crews and Lt. Seralles, whose legs were broken, were suffering from hypothermia. Each of them was moved to a helicop-

CONTINUED ➡

ter and quickly returned to McMurdo Station for medical treatment.

Helicopters were first used in Antarctica during the U.S. navy's *Operation Highjump* in 1946 and 1947. Since it was introduced during 1971-1972 austral summer, no fatalities have resulted from UH-1N crashes until this year. The last fatal helicopter accident was in 1969, when a LH-34D helicopter crash landed and caught fire about 57 nautical miles from McMurdo Station. Two men were killed.

Whalers march to end whaling ban

Eugene Register Guard, April 20, 1993, Tokyo

About 1,000 demonstrators carrying whale-shaped balloons marched Monday in Tokyo to press for an end to a ban on commercial whaling, as the International Whaling Commission began its annual meeting. Whale researchers from six nations gathered in Japan's ancient capital of Kyoto to discuss formulas for calculating possible catches in the Antarctic, commission officials said. The result will be reported to the IWC's scientific committee, which will meet later this week. The general commission meeting is scheduled for May 10-14.

Six Ships Leave to Hunt Minke Whales

Bodo, Norway

Six whaling ships trying to elude protesters slipped out of arctic ports this weekend to hunt minke whales for a month as part of a Norwegian research project. The hunt comes after Norway's decision to resume commercial whaling next year in defiance of the 38-nation International Whaling Commission. The International Whaling Commission's ban on commercial whaling took full effect in 1987, over Norway's protests. However, the commission has allowed research hunts, and Norway said last year that it would kill 110 minke whales in a 32-day research hunt this summer.

No Incineration by NSF

courtesy of Antarctica Project

Incineration at the U.S. base at McMurdo will be a thing of the past, according to a statement by the new Director of NSF's Office of Polar Programs. In a statement released in June, Dr. Sullivan announced that preliminary results of a study of emissions from the incinerator indicated higher than expected levels of dioxin and hydrogen chloride. Rather than mitigate these emissions, NSF has decided that "incineration will no longer be the proposed action." In other words, NSF has opted not to use incineration as a method for disposing of food waste.

In 1991, NSF stopped the open burning of solid wastes at McMurdo. Although the NSF waste management program includes segregation, recycling and waste minimization, in 1991-92, incineration was used to dispose of food waste. In Dec. 1992, NSF began a study of emissions from the incineration, and shortly afterwards the incineration was stopped. Now that analysis of emissions monitoring data has been completed, Dr. Sullivan has decided that incineration will not restart. The Antarctica Project applauds his wise decision to avoid the environmental problems posed by incineration.

Remembering 'Short' Seeley

Mel Thomson

ALTHOUGH I HAVE traveled the length of the Alaskan pipeline to Prudhoe Bay and, on another occasion, journeyed to within 700 miles of the North Pole, not until recently did I realize the tremendous impact that the State of New Hampshire has had in the development of the Alaskan sled dog.

As Governor, I attended these sled dog races held several winters in Laconia, but not even then did I realize that almost fifty years earlier, the sled dog authorities of the world had beaten a path to the little New Hampshire village of Wonalancet.

The first international sled dog race was held in Berlin in 1922. It was won by Arthur Walden, a veteran of the Alaskan freighting trails. The lead dog of that team was Chinook, meaning "Warm Winds." Walden and his wife had bought a farm in Wonalancet and turned their house into an inn. Behind the inn there began the famous Chinook Kennels.

About this time, a young physical education teacher from Worcester, Mass., became interested in sled dog racing. In 1924, Eva "Short" Seeley and her husband, Milton Seeley, came to Wonalancet to spend their honeymoon.

In a relatively short period of time, the Seeleys bought first a half-interest and then the entire farm from the Waldens. By this time, "Short" Seeley and her husband were happily involved in raising and breeding, primarily the Alaskan Malamute and Siberian Huskies.

Due largely to her interest in sled dog racing and breeding, "Short" Seeley was a leader in establishing the American Malamute Club and later, the Siberian Husky Club, each of

which were later accepted for membership into the American Kennel Club.

In 1928, the Seeleys helped their friends, the Waldens, supply the sled dogs for the expedition of Admiral Richard E. Byrd to establish Little America in the Antarctic. Later in 1933, the Seeleys supplied almost 100 dogs for Byrd's second expedition to the Antarctic.

Admiral Byrd and some of his party visited the Chinook Kennels on at least two occasions. From the Admiral's experience and interest, developed the American interest in sled dogs for military work, including carrying gun parts in those areas of the world where snow blanketed the terrain for most of the year.

Yesterday, Jim Wall, the new owner of the Chinook Kennels and the farm in Wonalancet conducted a memorial program to mark the fascinating history of the Chinook Kennels and the Seeleys who had done so much to advance the breeding of sled dogs in America. Scheduled participants included this writer, representatives of the state's Historic Resources Division, the Tamworth Republican Club members and various sled dog organizations from around the country.

To many like myself, who were active in state Republican politics, "Short" Seeley was the loveable and highly efficient "little terror" of the party. I first met "Short" when she was conducting the Republican candidate's night programs in the Ossipee area.

She ran those meetings like a drill sergeant. She tolerated no departure from the rules, which she laid down quickly at the

beginning of the meeting. A cardinal rule required every candidate to say what he or she had to say within the space of three minutes. At the end of three minutes, she had an alarm clock go off.

Between the terrifying sound of the clock and the peremptory banging of her gavel, the poor candidate who foolishly transcended her three minute limit was left in confusion and disarray.

The wise candidate quickly learned to say what he had to say and be done before his three minutes were up.

I recall in the early days of my gubernatorial candidacy against Governor Walter Peterson, whom she supported, meeting "Short" Seeley on the streets of West Ossipee. When I tried to give her a piece of my literature, she quickly and emphatically informed me that she was backing the Governor and that I had no business running against such a fine man. I thanked her (for what, I will never know), and took my subdued leave of her presence.

When, in time, I finally won the Governorship from Walter Peterson, I soon found that I had one of the strongest supporters ever in "Short" Seeley. She was the kind of great Republican who, once the votes were counted, had no trouble at all in adjusting to the decision of the electorate, providing, of course, that it was a Republican victory.

The memory of "Short" Seeley is one of the great delights of my years of service. She was a loveable lady, whose crusty surface, like that of a pie, covered a rich center of sweetness and goodness.

Ozone Over Antarctica

The amount of ozone in any location varies. In their brief lifetimes, ozone molecules drift and swirl above the Earth's surface, blown in varying concentrations by wind. Atmospheric scientists say that if ozone were visible from space, its changing concentrations would look much like the familiar weather satellite images of moving clouds.

Because of this constant movement, the amount of ozone above any given spot on the planet—and hence the amount of ultraviolet light filtered out—can vary widely from hour to hour. Ozone concentrations also change more predictably on separate natural cycles of one day, one year, two years, and 11 years.

There are two reasons why there is such uncertainty—among scientists if not environmentalists—about the relative danger of ozone depletion. One is that all living things have been coping with large swings in ozone, and hence UV radiation, for millions of years. The other is that because of these natural swings, measurements of ozone levels go up and down in irregular ways and it is hard to see a long-term trend against the background. Scientists refer to it as trying to pick out the signal from the noise.

For example, the annual cycle means that the amount of ozone in the atmosphere above temperate latitudes is naturally about 20 percent higher in April than it is in October. The actual number varies from year to year; 20 percent is an average over the past 60 years.

Amounts of ozone over tropical regions also vary by about 4 to 5 percent over a roughly two-year cycle, in step with a biennial reversal of the prevailing high altitude winds over the equator. In addition, the roughly periodic warming of the southern Pacific ocean surface known as El Niño also causes tropical ozone levels to fluctuate by 3 to 4 percent. Sometimes El Niño and the biennial reversal are in phase, their effects adding together; at other times they almost cancel out each other.

Even the 11-year sunspot cycle plays a role, the presence of sunspots corresponding to times when the spectrum of solar radiation is most favorable to creating ozone.

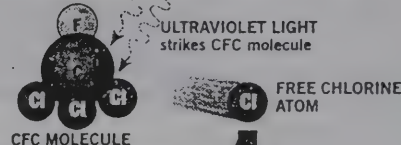
"You've got to take the solar cycle into account," said James Angell, who monitors global ozone cycles for the National

HOW CFCs DESTROY OZONE OVER ANTARCTICA

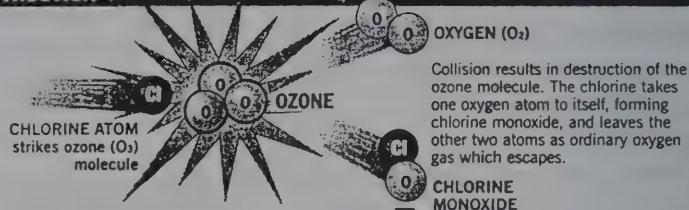
The chemical reactions that lead to runaway breakdown of ozone above the South Pole have only recently been understood. There are several possible chemical pathways and chemists debate which are predominant. This is one set of reactions that experts agree accounts for most of the ozone loss.

SOURCE OF THE CHLORINE

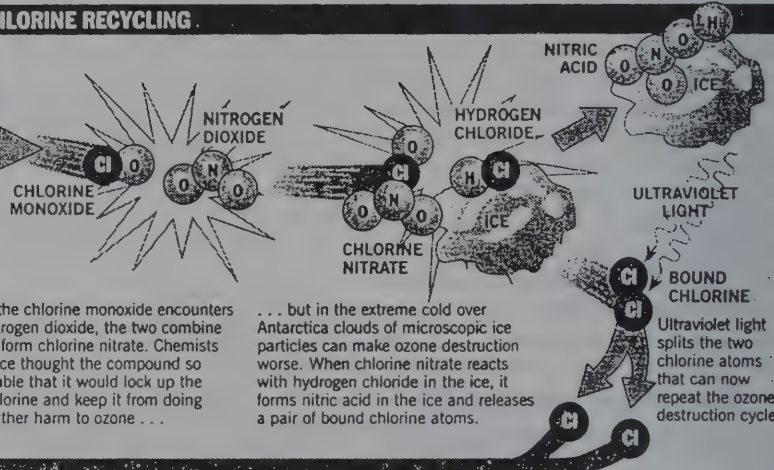
Manmade CFCs are contained in refrigerants, solvents, etc. The CFCs gradually rise into the stratosphere high above the Earth. There, ultraviolet light strikes molecules of CFC, liberating chlorine atoms.



OZONE DESTRUCTION



CHLORINE RECYCLING



Oceanic and Atmospheric Administration. "If you don't, you could see an ozone change and think that something else caused it."

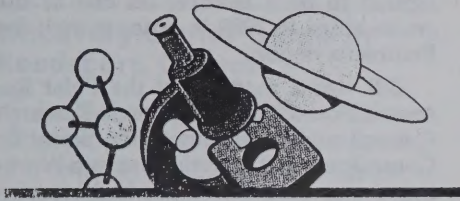
Angell's data show that global ozone levels rise and fall about 2 to 3 percent through a normal solar cycle. For example, from 1979 (a maximum in the sunspot cycle) to 1985 (a minimum) global ozone levels dropped because of the solar cycle. This happens to be the period in which the Antarctic ozone hole was first detected.

Since then, the cycle rose again, peaking in a maximum that ran from 1989 through 1991. But during what should

have been a period of high ozone production, Angell's observations show ozone declined by 2.7 percent. This suggests other factors, possibly including human causes, pushed depletion faster than creation.

"All the factors that affect ozone go on simultaneously and that makes it very hard to pick out any one of them and say it's responsible for this and such a part of the change," Stolarski said. "Some things are extremely solidly known and some are not. One thing we can say is that we are very confident the overall depletion of ozone is real."

YOUNG EXPLORERS' PAGE



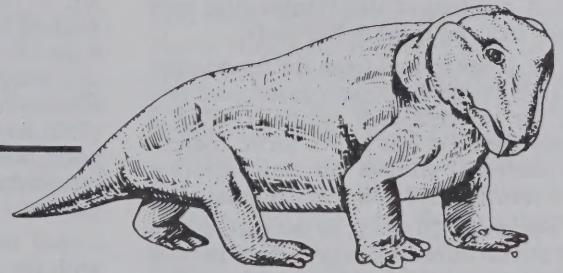
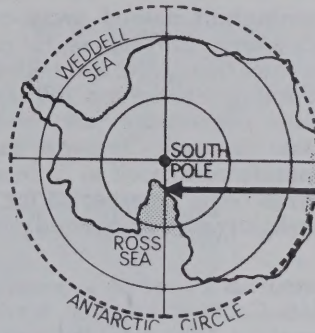
PUFFINS



Why does a puffin's beak look so strange? Both sexes sport the strikingly patterned beak, which plays a part in courtship. After the breeding season, the colorful outer plates are shed and the birds are left with smaller, duller bills.

LYSTROSAURUS

Bones of lystrosaurus, a land reptile from the Trassic Fremouw Formation of the Beardmore Glacier area, have been one of Antarctica's most exciting fossil finds, for they show remarkable similarity to lystrosaurus remains of the same age found in South Africa, thereby providing important evidence that these two continents were once closely linked. Lystrosaurus was a herbivorous animal, probably preferring to live near water and moving across the land in herds. Bones of reptiles and amphibians were also discovered in the Fremouw Formation.



Did You Know . . .

. . . that there are giant emeralds floating in the ocean and they come from Antarctica? Too bad these rare gems will probably melt before you get them home. This article from the science scene of the *San Jose Mercury News* gives a few clues as to how the "emeralds" are formed.

Research floats explanation for green icebergs

San Jose Mercury News

Australian and American scientists working in Antarctica have completed a study that discovered how some icebergs get their green tint. At one time, icebergs were thought to be made of fresh water that came from a glacier. That idea persisted even though scientists knew that sea water freezes to the bases of floating ice shelves, in some places plastering on a layer thicker than the length of a football field. The authors of the study, published in the *Journal of Geophysical Research*, say the green icebergs are made when a piece of an ice shelf snaps off, then capsizes or flips on its side to expose the marine ice. Only one in 1,000 icebergs is green, and such icebergs originate in Antarctica. The color comes from dissolved, yellowish brown plankton remains that have been trapped in the ice.

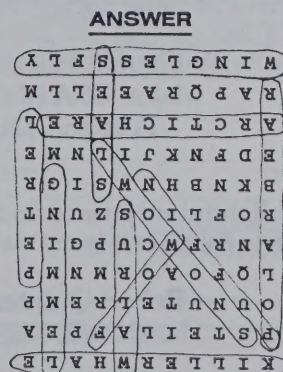
WORD SEARCH

Can you find the names of these 12 cold-climate creatures among the jumbled letters below?

Walrus, Petrel, Penguin, Killer Whale, Puffin, Polar Bear, Lemming, Seal, Snow Owl, Arctic Hare, Wolf, Wingless Fly

DIRECTIONS:

Circle each complete word horizontally, vertically, or at an angle. Sample:



K I L L E R W H A L E
P S T E I L A F P E A
O U N U T E L R E M P
L Q F O A O R M N M P
A N R F W C U P G I E
R O F L I O S Z U N T
B K N B H N W S I G R
E D F N K J I L N M E
A R C T I C H A R E L
R A P Q R A E E L L M
W I N G L E S S F L Y

OBITUARIES

THOMAS O. JONES, *Washington Post*, March 8, 1993

Thomas O. Jones, 84, a former chemistry professor and retired official of the National Science Foundation who specialized in Antarctic and atmospheric studies, died of pneumonia on March 7, 1993 at the Randolph Hills Nursing Center. A resident of the Washington area since 1956, he lived in Bethesda.

Dr. Jones retired from the foundation in 1978 as special deputy assistant director for international affairs. During 2 years there, he was an Antarctic and environmental studies program director and an official of national programs.

For nearly 20 years, he taught chemistry at Haverford College, where he was a professor and department chairman.

During World War II, he did atomic research at the University of Chicago as part of the Manhattan Project.

Dr. Jones was awarded the Order al Merito of the Chilean government for his work on the Antarctic and the Meritorious Service Award of the National Science Foundation.

He was a member of Phi Beta Kappa, the American Geophysical Union, the American Chemical Society and the Cosmos Club.

Survivors include his wife of 42 years, Phyllis Jones of Bethesda; two children, Elizabeth C. Jones of Bethesda and Phyllis Jane Jones of Pownal, Maine; a sister, Eleanor Spangler of Whitewater, Wis.; and a grandson.

WILLIAM S. BENNINGHOFF (Tim Hushen, San Diego State University Foundation)

Bill Benninghoff passed away on Jan. 8, 1993, after a short illness. He remained the same thoughtful and selfless friend and colleague to the end. Bill said in a telephone conversation just before his death that "up until Christmas day 1992, he considered himself to be in as good health as could be expected for a retired, but slightly over-committed professor."

Bill started his career as a botanist with the U.S. Geological Survey, working extensively in Alaska and the Arctic after receiving his Ph.D. from Harvard University in 1948. He did the early pioneering work on the effect of permafrost on vegetation. While at the Survey, he became the Chief of the Alaska Terrain and Permafrost Section. In 1957, Bill accepted a position at the University of Michigan from which he retired in 1988 as Professor of Botany and Director of the Matthaei Botanical Gardens.

Bill made four trips to Antarctica in 1968, 1976, 1977, and 1989. In 1977, Anne joined Bill to conduct a project studying

the electrostatic field impact on the transportation of pollen and spores. They enjoyed their trip to the ice so much that Bill agreed to be a lecturer on one of the cruise ships in 1989 in order to visit the Peninsula region.

Bill was a member of the Polar Research Board of the National Research Council and chairman of the Scientific Committee on Antarctic Research Working Group on Biology. He had keen interest in polar biology, conservation and monitoring, and many of his farsighted proposals are now being implemented in the Antarctic.

RICHARD GOLDTHWAIT, *Burlington County Times*, July 12, 1992

Columbus, Ohio (AP)—Richard P. Goldthwait, founder of Ohio State University's Institute of Polar Studies, died Tuesday of a stroke in a Wolfeboro, N.H., hospital. He was 81.

Goldthwait, who specialized in glaciers, spent 31 years at Ohio State before retiring in 1977. He studied glaciers in the Yukon, Alaska, Greenland, and Antarctica and made the first seismic soundings through glacial ice in 1936.

Goldthwait founded the polar studies institute in 1960. In 1986, the Geological Society of America gave him its Distinguished Career Award.

Letters from Readers

Dear Editor:

When the mail was delivered yesterday—what to my wondering eyes did appear, not a sleigh and not eight tiny reindeer, but *The Polar Times*. Congratulations on the resurrection of an old friend. . . and I like the new format.

Brewster Sturtevant
Springfield, Mass.

Dear Editor:

Congratulations on starting up *The Polar Times* again. August Howard was a sad loss and your Phoenix-like republication is a fitting memorial to his work as well as filling the void he left.

Graham Young
Pelican Bay, Naples, Florida

Dear Editor:

I find it most remarkable to learn that the American Polar Society has come back to life.

William D. Hackett
Major, USA (Ret.)
Portland, Ore.

Dear Editor:

What a delightful surprise to find a copy of the new *Polar Times* in my mailbox.

Robert Quintero
Hazel Park, Mich.

Dear Editor:

I not only enjoyed *The Polar Times* as a "read," but also found it very useful

as a reference. Sure do miss it. Glad that I won't have to be morose about this any more.

Hal Vogel
Willingboro, New Jersey

Dear Editor:

I'm glad some have seen fit to keep the society going.

Lyman P. Wenger
Ada, Mich.



HERO News

Discovery Center Opens in Reedsport, Oregon

The Richard E. Byrd National Antarctic Center is up and running. Our exhibit building, the Antarctic Discovery Center, was formally opened on Aug. 28. Displays inside are highlighted by an eight-foot statue of Admiral Byrd, sculpted by Dr. Felix DeWelion at the behest of the National Geographic Society. Other displays include an exhibit of meteorites collected

in Antarctica by the national Aeronautics and Space Administration (NASA) and displays of Antarctic survival clothing and camping equipment. A modern theater has periodic showings of Antarctic films, and a gift shop sells scientific and educational material on Antarctica.

The Antarctic Research Vessel *Hero* sits at its own pier beside the Discovery Center. It has been dressed up by a team of inmates from the Oregon Department of Corrections. Old *Hero* sailors say it looks

better than it did in Antarctica. The *Hero* has also served as a catalyst for waterfront revitalization along the Umpqua River by the city of Reedsport and private developers. A first-class seafood restau-

rant, a jet boat marina, a sail-in marina for visiting *Hero* and the Discovery Center, a boat launch ramp and park, and a coffee shop are laced together with a series of board walks and piers. Thus, a formerly run-down industrial area is now an appealing visitor's attraction.

We do have bigger plans, however, and need your help. We need additional funds for displays both in the Antarctic Discovery Center and on board the *Hero*. We plan to eventually have a 40,000-square-foot center under a geodesic dome that is a twin of the one at the South Pole. Visitors will enter an environment that is a microcosm of Antarctica—the next best thing to being there. Many of you have fund-raising experience for projects such as this, and we welcome your advice and suggestions.

We are proud of the progress thus far and are very thankful for the support of all who have contributed time, artifacts, and money. It is only a beginning, however, and we encourage your continued support.

—Doris Wadsworth



HERO FOUNDATION

Development of the Richard E. Byrd National Antarctic Center by the Hero Foundation is a project that is national in scope. Although the United States has led the world in Antarctic research and exploration, very few Americans have ever had the experience of visiting Antarctica, and because of the difficulty and expense of traveling, very few ever will. The National Antarctic Center will, accordingly, bring an "Antarctic Experience" to the United States to educate and inspire the American people about Antarctica. We expect to eventually accommodate over a million visitors per year.

We invite all Antarticans and Antarticans-in-spirit to join the Hero Foundation and support this project with their contributions and help to realize this vision.

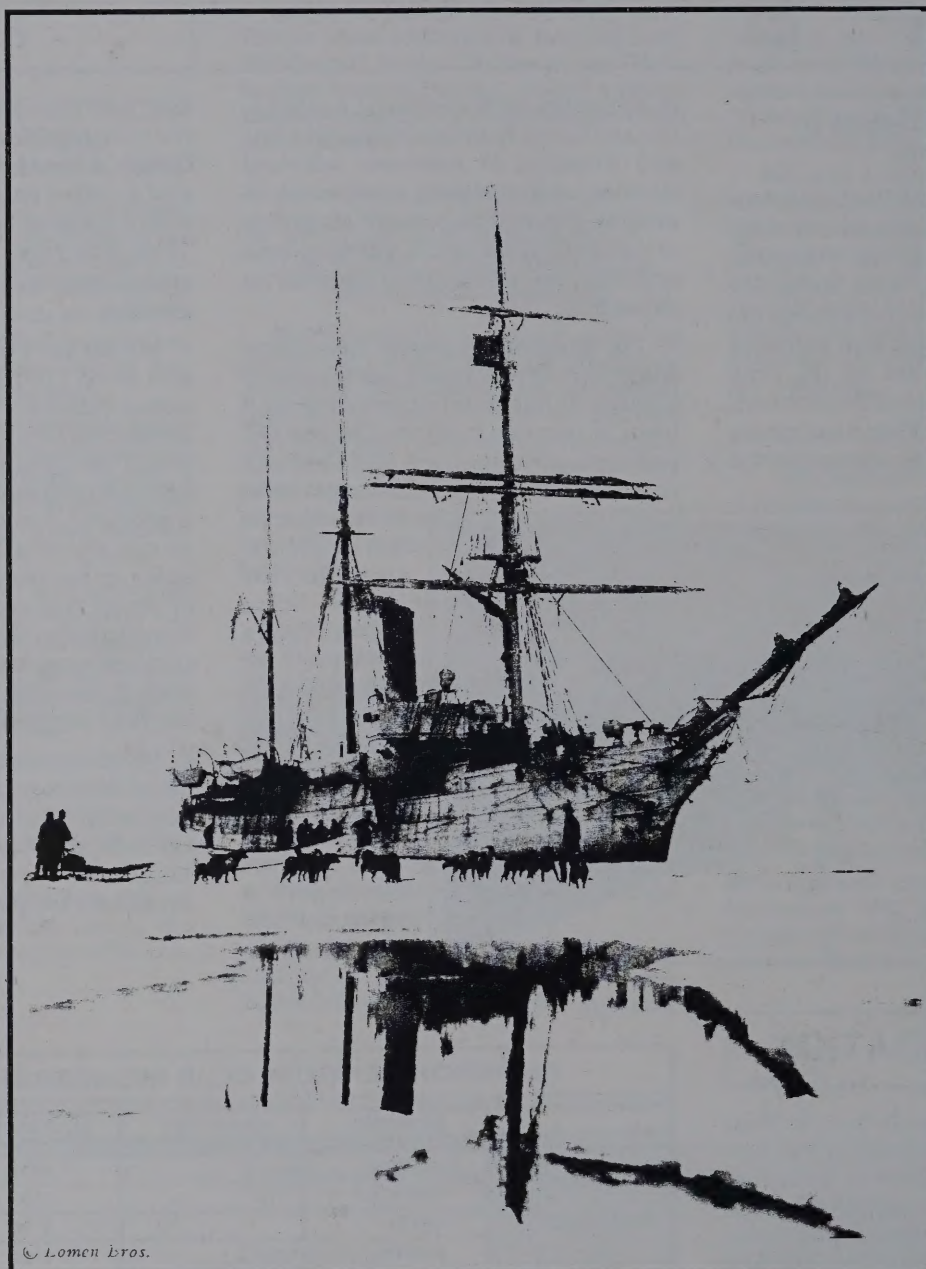
Sincerely,

Doris Wadsworth

President, Hero Foundation

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In the ice off Barrow

THE *BEAR*—WAITING TO BE RESCUED

The *Bear*, most distinguished of American polar exploration ships, with a record running from Greeley in the Arctic (1883) to the Revenue Cutter Service in Alaska (1880s to 1920s) to the Byrd expeditions in Antarctica (in the 1930s) to the Greenland Patrol (World War II), rests in shallow water on the ocean bottom just east of Boston. Millions of dollars are today being raised to resurrect ships with records that are marginal compared to the *Bear*'s. Can we old polar explorers—North and South—organize to rescue the *Bear*? Interested? Write "Rescue the *Bear*," c/o Brian Shoemaker, P.O. Box 692, Reedsport, OR 97467. (See article on the *Bear*, pg. 3)